

SIEMENS

**FireSeeker
Fire Alarm Control Panel
Model FS-250**

Installation, Operation and Maintenance Manual

P/N 315-049353-1

Siemens Building Technologies
Fire Safety

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INTRODUCTION

CONTROL PANEL LIMITATIONS

This control panel may not show an alarm condition without compatible initiating devices (smoke detectors, etc.) and notification devices (horn, lights, etc.) connected to it. Electrical ratings of the initiation and notification appliances must be compatible with the electrical ratings of the control panel and must be properly interconnected. The wiring used for interconnection must be large enough to carry the total current for all appliances without excessive voltage drop.

The control panel must be connected to a dedicated primary electrical source that has a high degree of reliability and adequate capacity for this control panel. The only means of disconnecting this power source shall be available only to authorized personnel and clearly marked "Fire Alarm Circuit Control".

The control panel must also have connected to it a battery set (24v) that has enough capacity to properly operate the system for 24 or 60 (depending on system type) hours standby and 5 minutes alarm per NFPA 72 (Chapter 1). These batteries do lose capacity with age. Batteries must be replaced when they fail to provide the control panel with the required standby and alarm power or after 4 years, whichever happens first. These batteries must be checked for performance at least two (2) times a year or more often if local requirements dictate.

Fire alarm control panels cannot last forever. Even though this control panel was made to last for the expected life of the fire alarm system, any part could fail at any time. Therefore a regular test program should be followed and documented to make sure that each part of the system is tested as in Chapter 7 of NFPA 72 or more often if dictated by local code requirements. Malfunctioning units must be replaced or repaired immediately by factory authorized service personnel.

NOTE  This control panel is designed to show an alarm condition when the initiating devices connected to it detect specific conditions. These conditions may or may not represent a life-threatening condition. Also, evacuation of a building or area unnecessarily may subject individuals to an unnecessary hazard. Therefore, it is most important that the building owner, manager, or representative promulgate, distribute, and/or post instructions describing steps to be taken when the fire alarm control panel signals an alarm condition. These instructions should be developed in cooperation and conformance with representatives of the local authority having jurisdiction.

As a backup or precautionary measure, it is strongly suggested that one of these steps should be to notify the local fire department of an abnormal condition even where the DACT option (or similar device) is included in the system.

PREFACE

Along with the use of this instruction manual, the appropriate following standards and the manufacturer's instructions for initiating and notification devices should be used to install and maintain a functioning fire alarm signaling system.

NFPA 70 National Electrical Code

NFPA 72 National Fire Alarm Code

NFPA 101 Life Safety Code

For other standards that may apply contact the authority having jurisdiction.

For NFPA publications, contact:

National Fire Protection Association
Batterymarch Park
Quincy, Massachusetts 02269

DESCRIPTIONS

FS-250 SYSTEM DESCRIPTION

The FS-250 is a modular fire alarm control panel. It features advanced addressable detection, programming, and memory capability. Its base configuration includes a power supply, a P2 addressable device circuit, four/ two notification circuits (NAC), serial interface circuit, four-status relays, and a programming port.

The FS-250 control panel mounts in a 22" x 18" back-box with overall cover size of 22-9/32" x 18-3/8". Operating controls and indicators are mounted on the inside hinged plate. An 80-character LCD display provides specific indications for addressable devices while LEDs indicate general panel status.

Semi-flush mounting kits are available for the enclosure.

The main board mounts in the rear of the enclosure. The power supply is physically contiguous with the main board. The FS-250 main board provides the connections for external field wiring. Optional boards mount on the main board or on the rear of the enclosure.

The display board mounts on the inner-hinged plate.

All normal operation is controlled via a membrane key pad. Displays are provided by an 80-character, alphanumeric, backlit LCD display and by discrete LED indicators for major control panel functions.

The 80-character LCD display is used to display event data, including alarms and troubles, identification of zone or device, and presentation of history. The display is controlled by a set of four push-button switches commanding the control processor. A back light is included in the display to assure visibility in low light, but to conserve power, it is only activated during a reported event or on operation of a display control switch.

Individual LEDs on the panel are provided to indicate SYSTEM ALARM, PREALARM, SUPERVISORY, ALARM SILENCED, SYSTEM TROUBLE and AC POWER ON. Direct push-button controls are provided for ALARM SILENCE, ACKNOWLEDGE, MENU and SYSTEM RESET.

Power Supply

A 24V nominal power supply provides all operating power to the control panel for both standby and alarm conditions. Sufficient battery charging capability is available to charge 38.5 AH sealed lead-acid batteries within code requirements for 60 hour quiescent plus 5 minutes alarm. The cabinet will hold batteries only up to 12 AH. The back-up battery is 24V, maintained by floating on the power supply. The battery will be automatically disconnected at low battery voltage to prevent deep discharge.

P2 Addressable Device Circuit

The FS-250 control panel has one addressable device circuit utilizing the P2 Detection Technology. The circuit has the capacity for 252 addresses.

Notification Appliance Circuits

The FS-250 control panel has four independent Class B (Style Y) notification appliance circuits (NACs). Pairs of NACs can be combined for Class A (Style Z) operation. This reduces the number of NACs to two. Each circuit can be selected to give continuous output or one of eight sounding patterns available in the control panel including the Siemens SYNC Protocol. There is also a system coder capable of zone-coded operation. All of the NACs are power limited.

Serial Interface Circuit

The FS-250 control panel has a Serial Interface Circuit that will drive up to 16 remote LCD annunciators and 8 Serial Relay Units and Serial Annunciator Units.

Status Relays

Four relays with dry contacts are provided. These relays are programmable to power fail, alarm, trouble and supervisory functions. The relay contacts are Form C and are rated 1A @ 28VDC resistive.

Programming Port

An RJ-11 jack is provided for a non-isolated RS-232 connection for temporary connection to a computer for panel programming.

OPTIONAL MODULES

FS-MT Municipal Tie Board

The Siemens FS-MT municipal tie board provides local energy and polarity reversal connections. The polarity reversal connections provide a trouble circuit and an alarm circuit with optional trouble output. The FS-MT mounts onto the main termination board (Cannot be used in conjunction with an FS-DACT Board).

FS-DACT Board

The Siemens FS-DACT Digital Alarm Communication Transmitter board will send control panel status data to a remote receiving station. The FS-DACT mounts onto the main termination board (Cannot be used in conjunction with the Municipal Tie Board).

FS-NPE Transformer Assembly

The Siemens FS-NPE optional transformer assembly provides an additional 3 amps of NAC power. The transformer mounts in the cabinet above the two transformers that come standard with the FS-250. A maximum of one optional FS-NPE is allowed per system.

Battery Sets

The FS-250 control panel is designed to use only sealed lead-acid or equivalent batteries for back-up power. Attaching a close-coupled battery box, if required, may allow use of battery sets beyond the physical capacity of the enclosure (12 AH for the FS-250). Maximum battery charging capacity for the FS-250 is 38.5 AH.

AUXILIARY MODULES

Serial LCD Annunciator

The FS-RD2 Serial LCD Annunciator consists of a backlit 80 character LCD alphanumeric display, 4 menu buttons, 4 dedicated buttons for operator interaction, 6 LED indicators, and a security key-switch. The display and controls on the annunciator are the same as those on the front of the control panel, including a key-switch for security. The backlight operates only when the data are being accessed, to conserve power. Up to sixteen annunciators may be addressed by the communications circuit, but some may require additional PAD-3 auxiliary power supplies, depending on the total accessory power loading.

Serial Relay Unit and Serial Relay Extender

The FS-RU2 Serial Relay Unit includes a processor board and a relay board. The processor board receives commands from the control panel for activating the relays and transmits supervision and control functions to the control panel. The processor board can control up to 3 relay boards. Each relay board provides 8 relays with Form C contacts. The control panel can address up to 8 Serial Relay Units and/or Serial Annunciator Units. PAD-3 auxiliary power supplies will be required to power units beyond the control panel capability.

Serial Annunciator Unit and Serial Annunciator Extender

The FS-SAU2 Serial Annunciator Unit includes a processor board and an annunciator driver board. The processor board receives commands from the control panel for activating the outputs and transmits supervision and control functions to the control panel. The processor board can control up to 4 annunciator driver boards. Each driver board provides 16 supervised outputs for LEDs or incandescent lamps. The control panel can address up to 8 Serial Relay Units and/or Serial Annunciator Units. PAD-3 auxiliary power supplies will be required to power units beyond the control panel capability.

PAD-3 Remote Signal Expander

The PAD-3 is a notification appliance circuit expander with a built-in auxiliary power output. This power source is designed to provide power for notification appliances, door holders and 4-wire smoke detectors. The PAD-3 provides 6 amps of 24 VDC power for multiple uses. All 6 amps can be directed to 4 Notification Appliance Circuits (NACs). Each is rated at 3 amps and is power limited. Either 1 or 2 inputs can control the four outputs. These outputs are compatible with Siemens notification appliances.

The PAD-3 can be configured so that the inputs can be programmed to provide steady outputs, ANSI temporal outputs, or Siemens SYNC protocol for synchronized horn/strobe

outputs. It can also be programmed to silence Siemens sync horns while the sync strobes remain on, using two wires. This requires a silenceable and non-silenceable input.

The PAD-3 also offers a 3 amp auxiliary output for driving other portions of your fire alarm system.

P2 ADDRESSABLE DEVICES

FirePrint™ Smoke Detector

The control panel processor sends the sensitivity and pre-alarm settings to the detectors and polls the detectors as to their status. The detector determines normal, trouble, pre-alarm or alarm conditions and communicates the status to the control panel.

- Variable Thresholds - The detectors can be set to operate in various pre-programmed optimizations, depending on installation locations.
- Operator Alerts - The control panel can trigger an alarm or trouble automatically on the occurrence of a number of conditions of the detector. These include:
 - Maintenance alert
 - Pre-alarm alert
 - No response
 - Incorrect response

Heat Detectors

Addressable heat sensing detectors may be intermixed on the circuit for locations where heat sensing may be the most effective detection mode. The heat detectors may be programmed, through the control panel, for rate of rise operation.

Addressable Modules (Monitor and Control)

In addition to detectors, the circuit can communicate with addressable modules, allowing initiating devices or notification appliances with local power sources, and supervising the power sources.

Manual Stations

Addressable manual stations may be intermixed on the circuit with proper response programmed into the control panel.

Programming P2 devices

P2 devices can be programmed in the following two ways:

- DPU Device Programmer/Loop Tester - Refer to the DPU User's Manual, P/N 315-033260, for further information.
- FS-250 Panel Keypad - Refer to Programmer's Manual, P/N 315-049403, for detailed information of system programming. Used only for field removal and reinstallation of individual devices.

EVENT HISTORY

The control panel includes a non-volatile memory recording up to 2000 system events. Identified alarm, trouble, supervisory trouble, and other significant events will be recorded along with the date and time of occurrence, and can be inspected by operating front panel push buttons.

Events recorded in the history are:

- Alarm, Trouble, or Supervisory conditions.
- Drill, Recall and General Evacuation.
- Activation of NACs or modules used for sounders or strobes.
- Unit used for command functions. (Silence, acknowledge, reset, etc.)
- PAS_INHIBIT switch activation.
- Alarm silence (manual and automatic).
- System reset.
- Power up.
- Entry to Programmer Mode.
- Secondary configuration edited.
- Validity check on backup configuration. (Errors detected or no errors detected)
- Running of comparison function. (Same or different)
- Replacement of primary configuration.
- Execution of Auto-program.
- Exit from Programmer Mode.
- System time or date change.
- Input point disable/enable.
- Start and stop of walk test.
- Expiration of Walk Test Timer.
- Expiration of re-ring timer.
- Alarm/trouble/supervisory Acknowledgment.
- Trouble/supervisory restored to normal.
- Alarm verification counter rollover.
- Pre-alarm activation.
- Pre-alarm acknowledgment/restore.
- Alarm of zone with no outputs.
- Activation of points defined for logging.
- Detector maintenance alerts.

GENERAL DESIGN FEATURES

Environmental

All hardware is suitable for use in an interior or protected location.

Power Limiting

The AC power and battery wiring are not power limited. All other circuits leaving the control panel are power limited, provided the proper installation rules are maintained.

Ground Fault Detection

The control panel provides system ground fault detection and a ground fault will trigger the common fault buzzer and system trouble LED. In addition, each addressable loop circuit has its own ground detection circuitry and indicator.

NAC Operation

While the notification appliance circuits are essentially hardware circuits, the fact that the outputs are commanded and controlled by the processor does provide more versatility than in a total hardware system.

- Output Sounding Patterns - The notification appliance circuits are operable in different sounding patterns. Any circuit is selectable to any of eight software-generated patterns or continuous sounding. For convenience, three of the patterns are preprogrammed for March Time, Temporal, and Siemens SYNC Protocol.
- Control of Audible Silencing - It is possible to select an “auto-silence” mode, adjustable from 0 to 255 minutes for each NAC. Each notification appliance circuit programmed for alarm silence sequence will be silenced upon time-out of its auto-silence timer. The system alarm silenced LED will flash, indicating an auto-silence time-out.
- Audible Silence Inhibit - In addition to designation of water flow zones, the entire control panel may be programmed to inhibit audible silence for 0, 1, 3, or 6 minutes from the last alarm. System reset may also be inhibited.

Transient Protection

Transient protection devices are provided where needed to meet the requirements of UL864.

Security Features

Processor control and addressing allow inclusion of several functions to assure security of the system.

Multi-level password protection of programming functions prevents unauthorized configuration changes.

Device-type supervision: If the type reported by an addressable detector or module, does not agree with the configuration, the system reports a trouble. Device-address supervision: The system checks that all configured devices on the addressable device circuit and the

Serial Interface Circuit responds to an address poll. If a configured device is missing, the system reports a trouble. The system also polls unused addresses periodically. If a device responds to such a poll of a non-configured device, the system reports a trouble. Two devices addressed the same also cause a trouble to be reported.

REGULATORY STANDARDS

The FS-250 control panel meets the requirements of industry and government regulatory agencies as noted.

Federal Communications Commission

The FS-DACT meets the Class A requirements of the Code of Federal Regulations (CFR 47), Part 15, subpart J, for electromagnetic field emissions. The FS-DACT also meets the requirements of the Code of Federal Regulations (CFR 47), Part 68, for connection of equipment to the public switched telephone network.

Underwriters Laboratories

The FS-250 Fire Alarm control panel is listed under UL Standard 864 for compliance to NFPA Standard 72 for fire service.

GENERAL SPECIFICATIONS

Operating specifications for the FS-250 are as follows:

Environmental

- Operating temperature - 32 - 120°F (0 - 49°C)
- Relative humidity - Up to 85% @ 86°F (30°C)

Primary Supply

- Primary Input Voltage: 120 VAC (60 Hz) nominal
- FS-250 Maximum primary input current: 2.4A at 120 VAC

Secondary and Trouble Power Supply

- 24 volt lead-acid battery set:
- Maximum Charge Voltage: 27.8 VDC
- Automatic Low Battery Disconnect
- FS-250 Maximum Charge Current: 1.7A
- FS-250 Battery capacity: 7-38.5 A.H. (over 12 A.H. requires separate enclosure)

Auxiliary Power Outputs

- 0.4 amp maximum per power output circuit
0.5 amp total maximum available for auxiliary power output circuits, Serial Interface Circuits and option boards
- Non-Resettable Power Outputs
Power limited

Voltage: 24 VDC nominal
Ripple: 1.5 VAC maximum

- Resettable Power Output
Power limited

Voltage: 24 VDC nominal
Ripple: 1.5 VAC maximum

Status Relays

Four relays programmable for alarm, supervisory, trouble, loss of AC.

- Contact Rating: 1 A, 28 VDC maximum, resistive
- Form C Contact

Notification Appliance Circuits

- Power limited
- Supervised
- Maximum Standby Current: 3.4mA
- Alarm Voltage: 24 V FW nominal
- Maximum Ripple: 16 VAC
- Maximum Loop Drop Voltage: 1.0 VDC
- Four Style Z/Class B or two Style Y/Class A circuits
- Maximum NAC Current: 1.5 A / NAC circuit
Maximum total NAC current 3.0 A (6.0 A with optional FS-NPE transformer installed)

Serial Interface Circuit

- Power limited
- Supervised
- (+, -)Voltage: 24 VDC nominal
- (X+, X-) Voltage RS485 levels
- Maximum wire loop resistance: 11 ohms/line
- Communications: RS485

P2 Addressable Device Circuits

- Power limited
- Supervised
- Voltage: 24 VDC nominal
- Maximum Current (shorted): 0.375A
- Maximum wire loop resistance: 50 ohms (see Graph on page 42)
- Style 4 or 6 circuit
- 252 Addresses detectors and modules max.
- One Circuit

Municipal Tie (Optional Municipal Tie Board FS-MT)

CA

- Reverse Polarity: Selectable for Alarm with Trouble or Alarm only operation
- Power limited
- Supervised by receiver for short or open circuit.
- Supervised by control panel for grounded circuit.
- Voltage: 24 VDC nominal
- Current: 0.020A maximum (normal or trouble)
- Current: 0.025A maximum (shorted)
- Ripple: 1.5 VAC maximum

CT

- Reverse Polarity: Programmable for Trouble or Supervisory or either operation
- Power limited
- Supervised by receiver for short or open circuit.
- Supervised by control panel for grounded circuit.
- Voltage: 24 VDC nominal
- Current: 0.020A maximum (normal or alarm)
- Current: 0.025A maximum (shorted)
- Ripple: 1.5 VAC maximum

LE

- Local Energy
- Not power limited
- Supervised for open or grounded circuit by control panel.
- Voltage: 24 VDC nominal
- Standby Current: 0.007A maximum
- Alarm Current: 0.400A maximum
- Ripple: 1.5 VAC maximum
- Maximum wire loop resistance: 30 ohms
- Trip coil impedance: 14.5 ohms

DACT Circuit (Optional DACT Board FS-DACT)

- Power limited
- Supervised for short or open circuit
- Maximum Voltage: 60 VDC
- Maximum Current (shorted): 0.100 A

Additional Transformer (Optional Transformer Assembly FS-NPE)

Provides an additional 3.0 A of NAC power (max 1 per panel)

CONTROL PANEL OPERATION

OPERATION INSTRUCTIONS

Standby Condition

In normal standby operation, the green AC POWER ON LED should be illuminated and no other indicator operating. The display will show the system name, "System Normal" announcement and the current date, day, and time.

Alarm Conditions

- NORMAL ALARM

In case of alarm, the system alarm LED will operate in a flashing mode and the buzzer will sound. Local audible and visual signals and remote alarm signals will operate, and the LCD panel display will indicate the zone or point initiating the alarm.

On receipt of an alarm, proceed in accordance with the established emergency plan. Assure that all personnel are accounted for, and notify the Fire Department.

To silence the audible after evacuation, where permitted by the codes and control panel programming, press ALARM SILENCE. The alarm audible will be silenced, the alarm silence LED will be illuminated and a system trouble indicated. Operating the ACKNOWLEDGE button will silence the local buzzer and change the LED alarm indicator from flashing to steady.

- WATERFLOW ALARMS

Alarms detected on zones designated "waterflow" indicate sprinkler operation and the audible alarms cannot be silenced in this condition. Operation of alarm silence will produce no effect.

- POSITIVE ALARM SEQUENCE (PAS)

Activation of a zone programmed for PAS, activates the Alarm LED, display and buzzer (pulsing), and starts the PAS timer, but delays all other outputs (system and user) for 15 seconds.

Operation of the ACKNOWLEDGE button within 15 seconds will add a number of seconds (60-180) to the PAS timer. If the ACKNOWLEDGE button is not operated within 15 seconds, the system and user outputs activate.

If the initiating device and the panel are reset before the PAS timer times out, the alarm sequence is aborted.

An alarm condition on a detector programmed for direct alarm response (such as the key switch on a manual station) will over-ride the PAS timer and activate the outputs.

- PRE-SIGNAL

A point activated by a PRE-SIGNAL alarm device activates the alarm relay, alarm DACT, alarm LEDs and buzzers, and all user programmed outputs normally, except NACs. Only pre-signal NAC(s) operate at this time. Pre-signal NACs are for constantly attended central locations manned by trained building personal.

Operation of the SYSTEM RESET button within the pre-programmed time (60-180 seconds) after initiation of the pre-signal prevents operation of the general alarm and thus the general alarm NACs.

Failure to act within the pre-programmed time (60-180 seconds) will result in activation of the general alarm and thus the general alarm building NACs.

Receipt of a general alarm during the delay period immediately sounds the general alarm building NACs.

When the alarm condition has been corrected, return the system to standby operation by pressing the SYSTEM RESET button.



Do not reset the system until the alarm condition has been cleared. The LCD display will indicate the area in which the alarm was detected. The detector or module associated with the device initiating the alarm will display a light indicating activation (if applicable).

Trouble Conditions

In case of a trouble condition, the system trouble LED and any programmed trouble LEDs will be flashing, the LCD display will identify the problem, and the buzzer will sound. Refer to the applicable section of the system manual to determine the probable cause of the trouble and the action to be taken.

When a trouble has been noted, the buzzer may be silenced by pressing the ACKNOWLEDGE button. The trouble LEDs will change to a continuous display. If the trouble has not been corrected when the trouble re-ring timer expires, the trouble display will revert to its original condition and the buzzer resound.

If the control panel is programmed for trouble acknowledge required, when the indicated trouble condition has been cleared, the system will revert to standby condition after the ACKNOWLEDGE button is pressed.



Some trouble conditions require a system reset to restore the control panel.

Supervisory Conditions

Supervisory troubles are indicated similar to regular system troubles except that when a supervisory trouble is cleared, the cleared condition continues to be indicated until it is acknowledged.

Maintenance

In order to insure continued safe and reliable operation of the fire alarm system, periodic inspection and testing should be performed in accordance with applicable NFPA 72 standards.



If the system has remote connections to the Fire Department or other monitor, be sure to disable the remote signals and/or notify the remote monitoring station before performing test operations.

For any required service, refer to the system manual or contact a factory authorized representative.

ADDITIONAL OPERATING PROCEDURES

In addition to the basic fire alarm instructions above, several features are included to facilitate maintenance and increase the versatility of the system. Following are procedures to call up these functions.

Lamp Test

To operate the lamp test, press the MENU button. The LCD display will change to a MENU screen. Press the button next to the "More" indication twice. Then press the button by the "Lamp Test" indication. All lamps on the unit being operated will then light. Operating the button next to "Esc" will then return the control panel to normal display. Note that the lamp test operates the indicators only on the unit being operated, and no record is reported to system history.

Drill

To activate a fire alarm drill, proceed as follows:

- Press "MENU".
- On the MENU display, select "More".
- At the next screen, select "DRILL".
- At the next screen, select "Yes".
- Operate ALARM SILENCE to terminate drill signal.

Recall

To signal recall after a drill, proceed as follows:

- Press "MENU".
- At the next screen, select "More".
- Select "RECALL".
- At the next screen, select "Yes".
- Operate ALARM SILENCE to terminate recall signal.

Pre-Alarm

- A pre-alarm condition is annunciated by Pre-alarm LEDs and buzzers on the control panel and LCD Annunciators and Remote Processors. The LEDs flash and buzzers are on steady until acknowledgment.
- Acknowledging the Pre-alarm condition puts LEDs on steady and buzzers off.
- If pre-alarm has been acknowledged and restores to normal, the condition clears. If the system proceeds into an alarm condition, the pre-alarm condition clears whether or not it has been acknowledged and is replaced by alarm.

General Alarm

To activate a general alarm, proceed as follows:

- Press "MENU".
- On the MENU display, select "GENERAL ALARM".
- At the next screen, select "Yes".
- Silence and reset the system as with any alarm.

Alert

To activate alert alarm, proceed as follows:

- Press "MENU".
- On the MENU display, select "ALERT".
- At the next screen, select "Yes".
- Operate ALARM SILENCE to terminate alert signal.

History

The last 2000 system events are time-tagged and recorded for review in the user level event history. This history is available to anyone with the door key, but may be erased only at the maintenance security level.

- Operation of history:

New events overwrite old when filled.

Printer (if used) records all events.

For more information see the event history section

- Access to history:

To recall past events, proceed as follows:

Press MENU button.

Operate button identified as "More".

Operate button identified as "More".

Operate button identified as "View History".

Operate upper left button for previous event display.

Operate lower left button for next event display.

Operate upper right button to exit to MENU DISPLAY.

FS-250 OPERATING INSTRUCTIONS

Alarm Operation

In case of alarm, the *System Alarm* LED flashes, LCD will display alarm conditions and the panel buzzer sounds. Local audible and visual signals and remote alarm signals operate.

When an alarm occurs, proceed according to the established emergency plan. Assure that all personnel are accounted for, and notify the Fire Department to advise of the alarm and/or verify that an automatic signal has been received at the Fire Department.

Authorized Personnel Only

To silence the alarm:

To silence the notification appliances after evacuation, where permitted, press the **Alarm Silence** switch. The notification appliances and panel buzzer will be silenced, and LED indications will change from flashing to continuous. The *Alarm Silenced* LED will be lit.

Note: Do not reset the panel until the alarm has been cleared.

Warning: Alarm silence inhibit (if set) prevents the alarm from being silenced for a predetermined time.

To reset panel after alarm:

When the alarm condition is corrected, return the panel to normal standby operation by pressing the **System Reset** switch.

Trouble Operation

Trouble is indicated by:

System *Trouble* LED flashes
LCD will display trouble conditions
Panel buzzer sounds

To silence the trouble buzzer:

Press the **Acknowledge** switch. The *Trouble Silenced* LED lights and the specific trouble LED(s) may change to continuous display. When the trouble condition has been cleared, you may need to reset the panel to restore to a normal standby condition.

Warning: Leaving the panel in a trouble condition may cause a fire alarm condition not to initiate a fire alarm sequence

Normal Standby Condition

The green AC Power On LED will be lit and no other indicators on.

For service, contact: _____
Telephone Number: _____

Frame these instructions and mount them near the control panel for operator reference.

FS-RD2 OPERATING INSTRUCTIONS

Alarm Operation

In case of alarm, the System *Alarm* LED flashes, LCD will display alarm conditions and the buzzer sounds. Local audible and visual signals and remote alarm signals operate.

When an alarm occurs, proceed according to the established emergency plan. Assure that all personnel are accounted for, and notify the Fire Department to advise of the alarm and/or verify that an automatic signal has been received at the Fire Department.

Authorized Personnel Only

To silence the alarm:

To silence the notification appliances after evacuation, where permitted, operate the **Button Enable** key switch and press the **Alarm Silence** switch. The notification appliances and buzzer will be silenced, and LED indications will change from flashing to continuous. The *Alarm Silenced* LED will be lit.

Note: Do not reset the panel until the alarm has been cleared.

Warning: Alarm silence inhibit (if set) prevents the alarm from being silenced for a predetermined time.

To reset panel after alarm:

When the alarm condition is corrected, return the panel to normal standby operation by using the **Button Enable** key switch and then pressing the **System Reset** switch.

Trouble Operation

Trouble is indicated by:

System *Trouble* LED flashes
LCD will display trouble conditions
Buzzer sounds

To silence the trouble buzzer:

Operate the **Button Enable** key switch and press the switch. The System *Trouble* LED changes to continuous display. When the trouble condition has been cleared, you may need to reset the panel to restore to a normal standby condition.

Warning: Leaving the panel in a trouble condition may cause a fire alarm condition not to initiate a fire alarm sequence

Normal Standby Condition

The green *Power On* LED will be lit and no other indicators on.

For service, contact: _____
Telephone Number: _____

Frame these instructions and mount them near the annunciator for operator reference.

CONTROL PANEL INSTALLATION

PARTS SUPPLIED – FS-250

With Enclosure Packages (Black or Red)

- Backbox Assembly
- Front Door Assembly with
- Window
- Inner Door Assembly

With Electronics Package

FS-MB Main Board	899-G67197 #6-32 Keps Nuts (1)
FS-DB Display Board	906-220604 #6-32 x 1/4" Screws (17)
FS-DLC Loop Driver Board	375-F943165 Spacers (8)
215-649112 Keyboard	140-820405 24K Ohm 1/2W Resistor (4)
330-944373 Thermal pad	140-820350 120 Ohm 1/2W Resistor (2)
465-633943 Battery cable assembly	555-446055 Cable Assembly, 26 Pin
315-048353 Owner's Manual	130-PM3223 Bridge Rectifier
575-249351 Riser Diagram	555-449116 Rectifier Cable Assembly
315-049352 Operating Instructions	575-249349 Nameplate
600-149373 Ground Wire Assembly	950-220604 #6-32 Nut (1)

With FS-NPE Transformer Package

Transformer Assembly (120VAC) (2 required)	(899-G67197) #6-32 Keps Nuts (2)
--	----------------------------------

CAUTIONS

It is recommended that the printed circuit boards be removed for any procedure that may cause dust, metal shavings, grease or any such matter that may affect the circuit boards and/or parts. There may be several sources of power into the control panel. Each source must be disconnected prior to installing or removing modules, connecting or disconnecting wiring, and programming jumpers.

CONTROL PANEL LOCATION

The control panel should be located near an exit at ground level, where the normal ambient temperature is maintained within the control panel specification (See General Specifications). The unit should be in an area that is free of dust, vibration, moisture and condensation. Any auxiliary battery box or other accessory not connected through a protective device or a circuit designed for remote connection must be within the same room and connected through electrical conduit.

INSTALLATION

The enclosures must be fastened securely to a clean, dry, shock-free, and vibration-free surface. Consider the following when mounting the box.

Mounting height for visual and manual access to the Display Board

Weight and size of backbox

Local mounting codes

When mounting the backbox, position the backbox clear of obstructions so that the door can open freely and so that indicators and controls are easily accessible.

The fire alarm control panel must be mounted in a properly accessible location as required by applicable codes. Any auxiliary battery box or other accessory not connected through a protective device or a circuit designed for remote connection must be within the same room and connected through electrical conduit.

Installation is to be done only by qualified personnel who have thoroughly read and understood these instructions. The fire alarm control panel must be mounted in a properly accessible location as required by applicable codes.

ENCLOSURE MOUNTING

The backbox must be fastened securely to a clean, dry, shock-free, and vibration-free surface.

Consider the following before mounting the backbox.

- Mounting height for visual and manual access to the Display Panel
- Weight and size of backbox
- Local mounting codes

Install the backbox:

- Select a clean, dry, shock and vibration free surface.
- Position the backbox clear of obstructions so that the front door opens freely and the controls and indicators are easily accessible.
- Mark the locations of the two upper mounting bolts of the backbox on the wall.

NOTE  There are two key-shaped cutouts on the top of the backbox. Make sure the end with the two key-shaped cutouts is on top when installing the backbox.

- Drill the two holes located in the previous step and screw in the top bolts, leaving a small gap between the wall and each top bolt.

NOTE  The screw type and length must be able to support the control panel, options and battery set. You may need a different screw type, depending on the wall material.

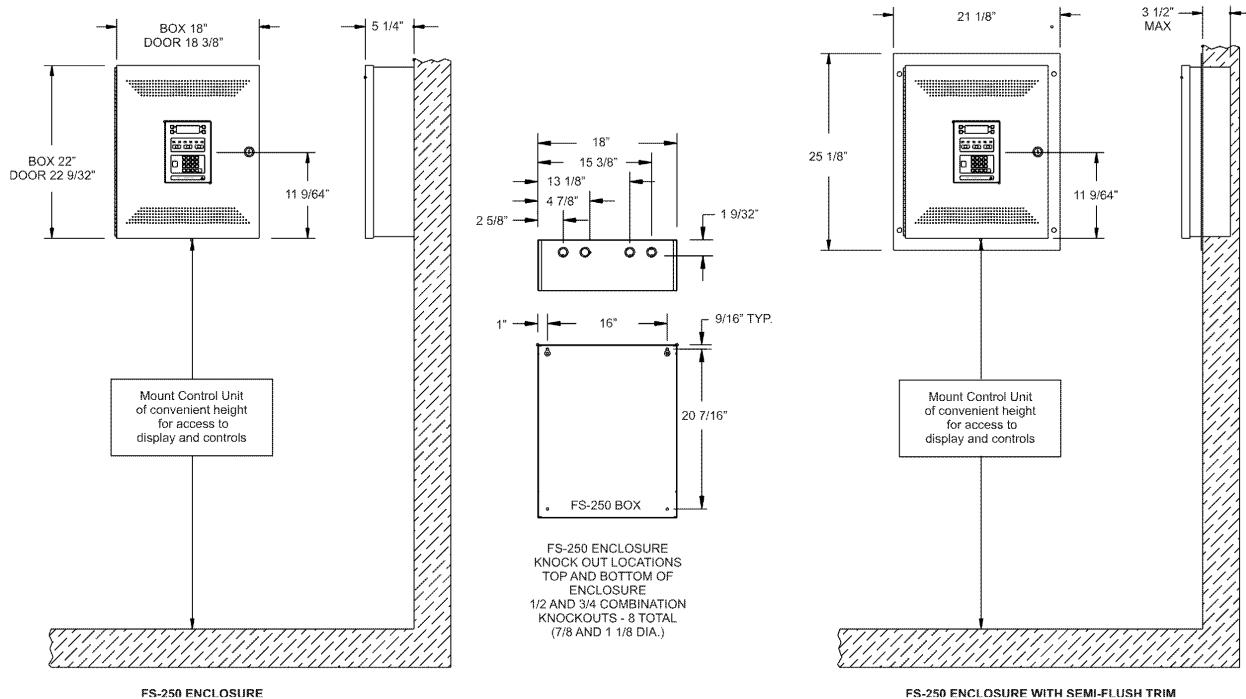
- Place the backbox over the two top bolts and allow it to slide down over the bolts.
- Mark, drill, and install the two bottom bolts in the backbox.
- Tighten all four bolts securely against the back wall of the backbox.
- The PAD-3 Auxiliary Power Supply or battery enclosure may be mounted immediately below the main enclosure, close nipple, allowing a minimum of 1 inch in between the enclosures for clearance between the doors. Keeping the wire run to the control panel short will keep the voltage drop to a minimum.
- If a semi-flush mount installation is desired, for the FS-250 use the FS-SFT(R/B) Semi-flush Trim. The back-box can be mounted up to 3 1/2 inches into the wall. Place the semi-flush trim around the back-box and affix to the wall with four #10 x 3/4 inch wood screws (provided with trim).



You may need a different screw type, depending on the wall material.

For semi-flush installations, if the PAD-3 Auxiliary Power Supply or a battery enclosure is required, it may be mounted immediately above or below the main enclosure, close nipple, allowing a minimum of 3 inches in between the enclosures for clearance between the semi-flush trims. Keeping the wire run to the control panel short will keep the voltage drop to a minimum.

FS-250 Enclosure Mounting Pictures



Remove Knock-Outs

Prepare the enclosure for electrical wiring, break out the appropriate conduit entry points. Segregation is required between power limited and non-power limited conductors. In order to maintain the minimum separation, the following wire routing is illustrated. Separation of at least a 1/4 inch is required between the non-power limited and power limited conductors. Power limited and non-power limited wiring must be run in separate conduit.

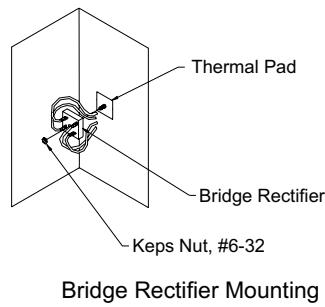
Attach conduit (if required) and run wires as required. Label each field cable for future reference.

Basic system wiring and detector siting must be in accordance with NFPA 72 or other instructions from the appropriate local authority. Unit connections and limitations are as indicated on the wiring diagrams included in System Wiring part of this manual.

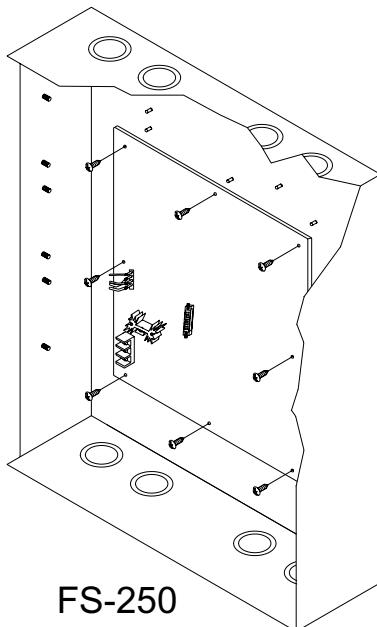
Wire reference data are included in Appendix A.

Main Board Installation

- Secure the board to the back of enclosure using the eight #6-32 x 1/4 screws provided.
- Secure the bridge rectifier to the back box using the thermal pad and a #6 keps nut. See drawing for details. Plug bridge rectifier into J4 on the Main Board.

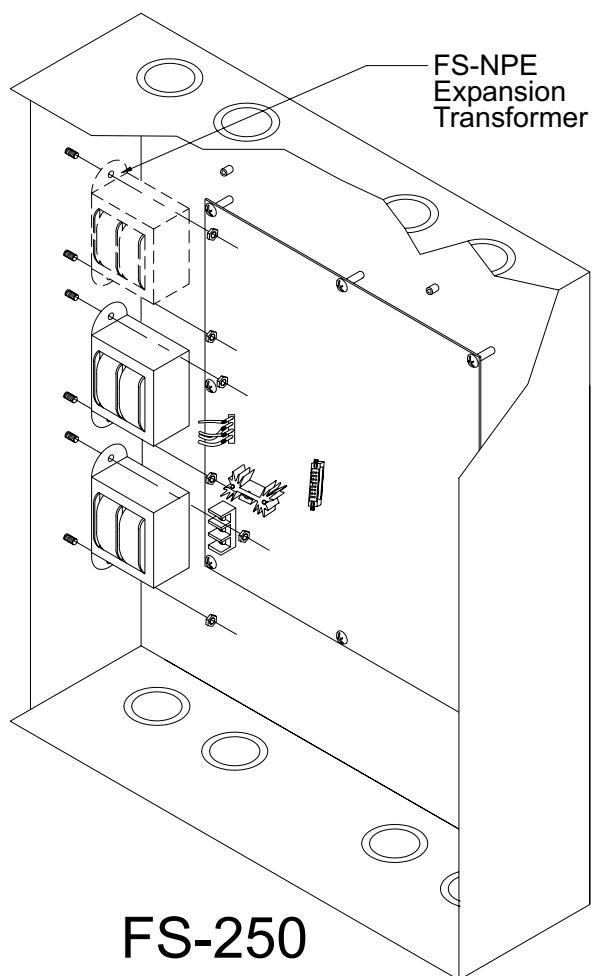


Bridge Rectifier Mounting



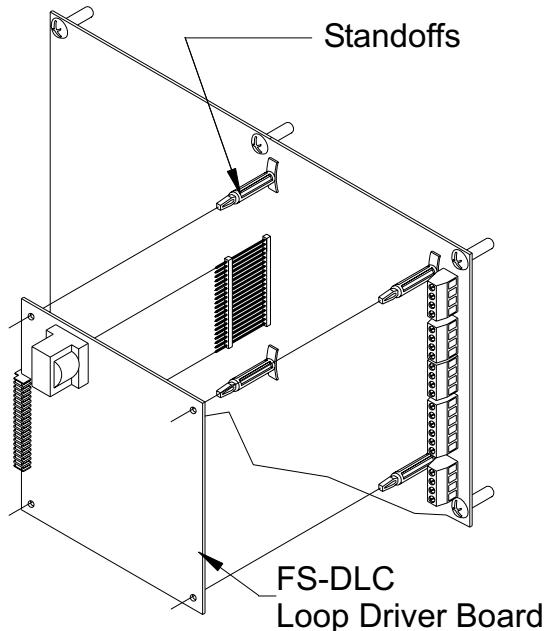
Transformer Mounting – FS-NPE

- Place the two FS-NPE transformer assemblies over the bottom two sets of studs on the left side of the enclosure. Mounting the transformer can be accomplished before mounting the enclosure if desired.
- Tighten provided transformer-mounting nuts.
- Plug the transformer assemblies into connectors J1 and J2 on the Main Board. Bottom transformer plugs into J1.
- If optional additional FS-NPE transformer is being installed, install it also at this time.



FS-DLC Loop Driver Board Mounting

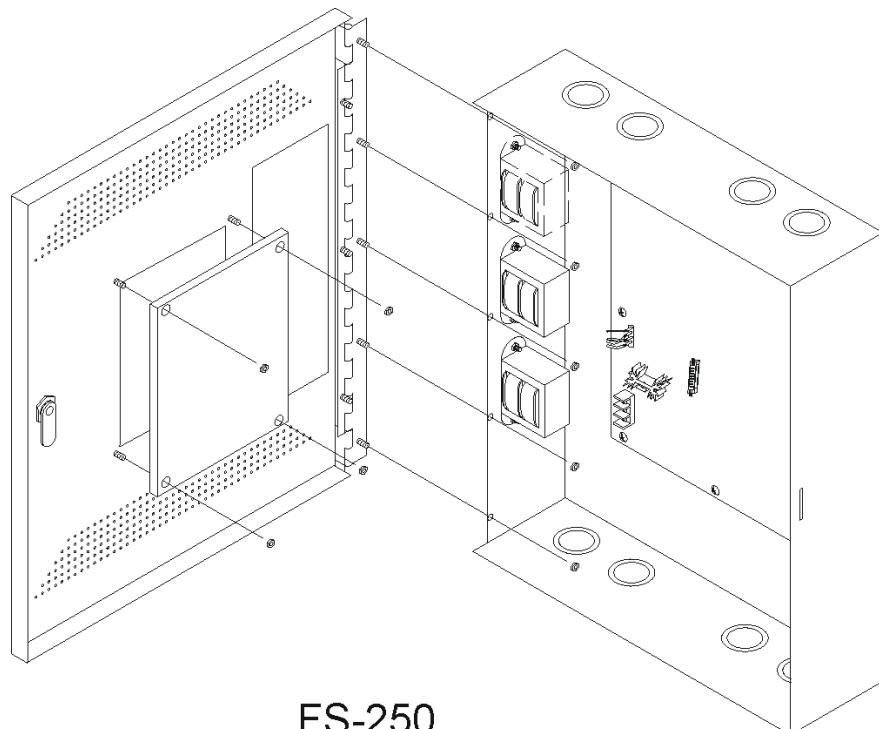
- Place the four provided standoffs in locations shown on the Main Board.
- Carefully align connector J1 on the Loop Driver Board with connector J9 on the FS-250 Main Board.



FS-250

Door Assembly

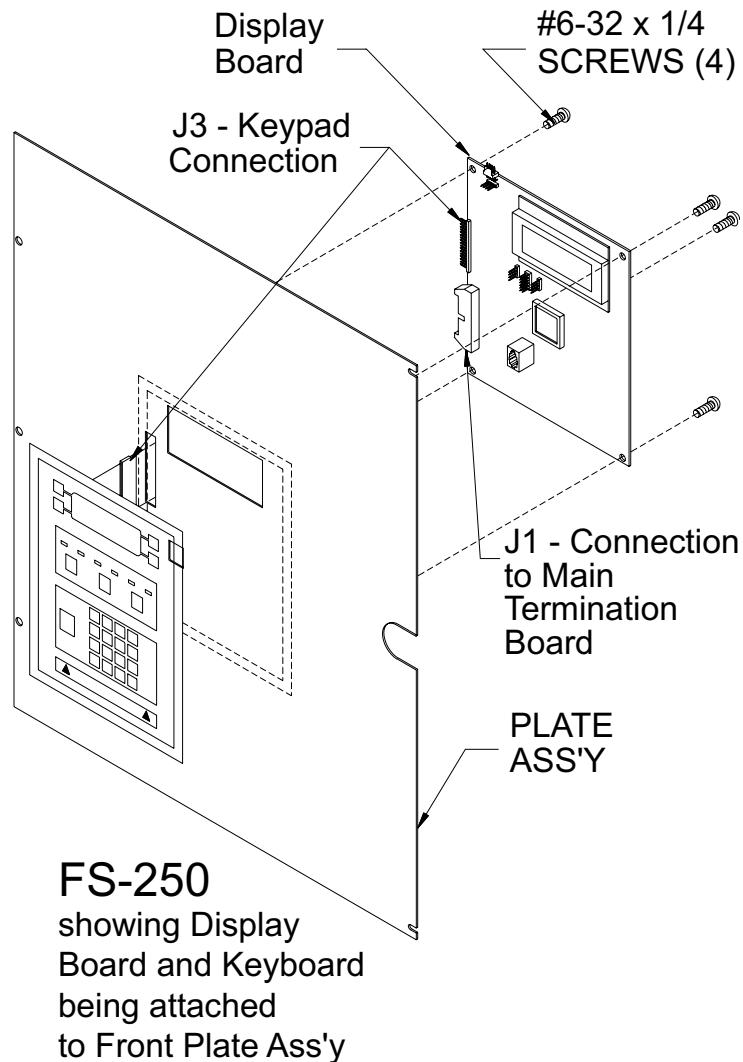
- Secure the Lexan window to door assembly using four of the provided #6-32 keps nuts.
- Place the Door Assembly on Backbox using five of the provided #6-32 keps nuts.



FS-250

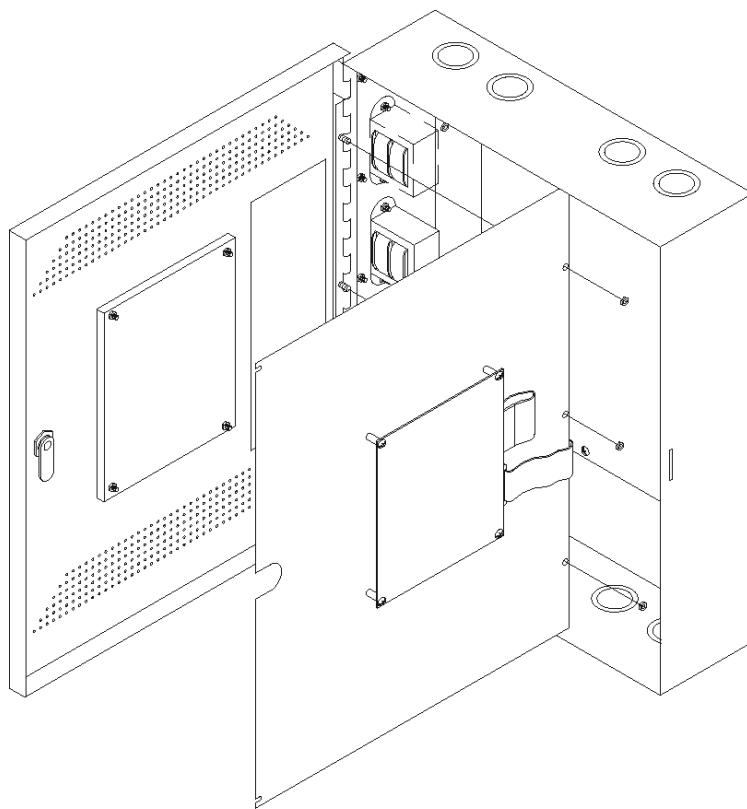
Display Board Installation

- With the Inner Front Plate closed, carefully pass connector and cable from keypad through vertical slot in front plate.
- Remove backing from keypad and carefully attach keypad to front plate. Center window in keypad on large opening in front plate.
- Attach the cable connection from keypad on the Inner Front Plate to connector J3 on the Display Board (FS-DB).
- Secure Display Board (FS-DB) to Inner Front Plate Assembly using four of the provided #6-32x1/4" screws (P/N 555-446055).
- Plug the Cable Assembly (P/N 555-446055) into connector J1 of the Display Board (FS-DB) and to connector J11 of the Main Board (FS-MB).



Front Plate Mounting

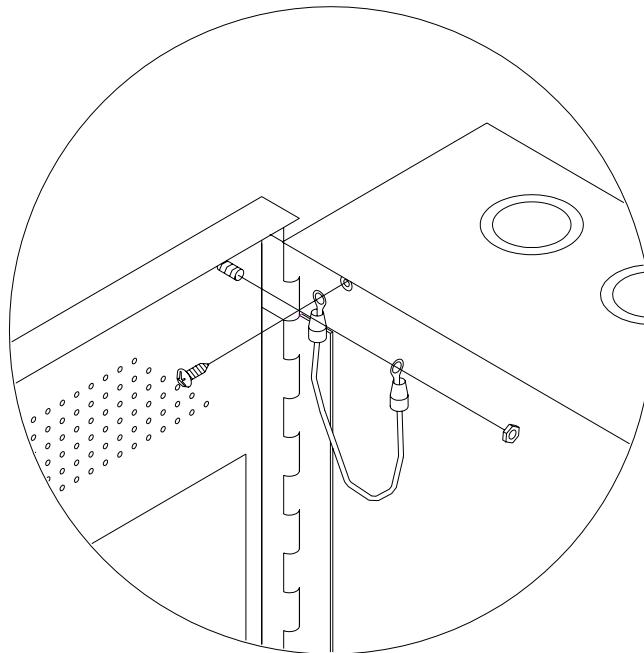
- Secure the Front Plate Assembly to Door hinge using three of the provided #6-32 keps nuts.
- Plug the Cable Assembly into connector J1 of the Display Board and to connector J11 of the Main Board.
- Front Plate is secured in place when closed by the two provided #8-32 x 3/8 sems screws. Locations on the Front Plate for the sems screws are the upper and lower right corners when closed.



FS-250

Ground Wire Installation – P/N 600-149373

- Attach Ground Wire (P/N 600-149373) to inside of outer door using provided #6 nut (P/N 950-220604).
- Attach Ground Wire (P/N 600-149373) to outside of inner door using provided #6 screw (P/N 906-220604).



SYSTEM WIRING

Before connecting the field wiring, check the wiring for opens, shorts, grounds and stray voltages.

WARNING

Damage may result if a high voltage insulation tester is used on wiring while connected to the control panel.

Terminate the field wiring to the main board in accordance with the diagrams in System Wiring Section and the system design documents



All wiring must be in accordance with local codes and the National Electrical Code. Use only wire as described in Article 760 of the National Electric Code.

AC Supply Connection

Wire the AC supply to terminal block TB1 on the main board. The supply should originate from a separate, fused circuit. It should be provided with a breaker or other means of isolation.

Observe the wiring order -- the bottom terminal is ground and must be wired back to the electrical panel ground (earth) bonding point or another good ground acceptable to the authority having jurisdiction and the electrical inspector. The neutral wire must be taken back to the electrical panel neutral distribution bar and must not be grounded.



Dangerous voltages will be present on this terminal block and on other components surrounding it and the transformer when the AC supply is turned on. Do not touch.

Battery Installation

WARNING

Improper battery connections or shorting battery terminals may damage the system and/or batteries and may cause personal injuries.

Place the batteries in the space provided in the bottom of the back-box. If a larger than 12 AH battery set is required, a separate enclosure, CAB-BATT or any enclosure UL Listed for Fire Protective Signaling Use, must be used.

The control panel uses a 24V battery set. Connect the two 12V batteries (or four 6V batteries) in series with wire that is rated for the maximum worst-case battery current draw. Route the battery leads to the left of the enclosure and up to the battery connector, J4. The battery leads are not power-limited. DO NOT CONNECT BATTERIES YET.

Powering The Control Panel

Apply AC power to the control panel. The AC POWER ON LED, SYSTEM TROUBLE LED, and the trouble buzzer should be on.

Observe polarity. Connect the B- (black) lead from the main board into the black or - terminal of the battery set and the B+ (red) lead from the main board into the red or + terminal of the battery set.

Optional Modules

See Appendix D for a listing of installation instructions for each optional module. Installation Instructions are provided with each optional module. Follow these instructions for proper installation.

When using the FS-DACT for either Remote Station or Central Station, you must set the "DACT Pwr Fail Tmr" in the "System Parameters" tab of FS-CT2 as follows:

Remote Station	15 Hours
Central Station	6 Hours

Check System Operation

Check for proper operation of all the system functions. See Operation Instructions Section.

WIRING

Basic system wiring and detector locations must be in accordance with NFPA 72 or other instructions from the appropriate local authority. Unit connections and limitations are as indicated on the wiring diagram included below.

Devices that may be satisfactorily used with the control panel are shown in the compatible device listing in Appendix B.

Wire reference data are included in Appendix A.

Control Panel Wiring Overview

In compliance with NEC Article 760 and UL 864, all power limited fire protective signaling conductors must be separated a minimum of 1/4 inch from all of the following wiring located within a control panel:

- Electric light
- Power
- Class 1 or non-power limited fire protective signaling conductors

To meet these requirements, the following guidelines **must be observed** when installing modules and wiring to this control panel.

When installing power limited field wiring, the installer must comply with NEC article 760, which states:

The fire alarm power-limited circuits are installed using Types FPL, FPLR, FPLP or permitted substitute cable, provided these power-limited cable conductors extending beyond the jacket are separated by a minimum of 0.25 in. (6.35 mm) or by a nonconductive sleeve or nonconductive barrier from all other conductors.

If energy limited cable or equivalent is not used within the FS-250 enclosure, then the following guidelines do not apply. In that case, be sure to follow standard wiring practices.

Wiring Entering Enclosure

- Non-Power Limited Wiring - Wiring entering the enclosure from the bottom left side of the backbox is considered non-power limited wiring. Wiring must be in the shortest route and must not overlap any other wiring.
- Power Limited Wiring - Wiring entering the enclosure from the top and the left side of the backbox is considered power limited. Wiring must be in the shortest route and must not overlap any other wiring.

Install Wiring

The primary mains input must have a separate or dedicated circuit breaker. Wire in accordance with local codes and NEC 760.

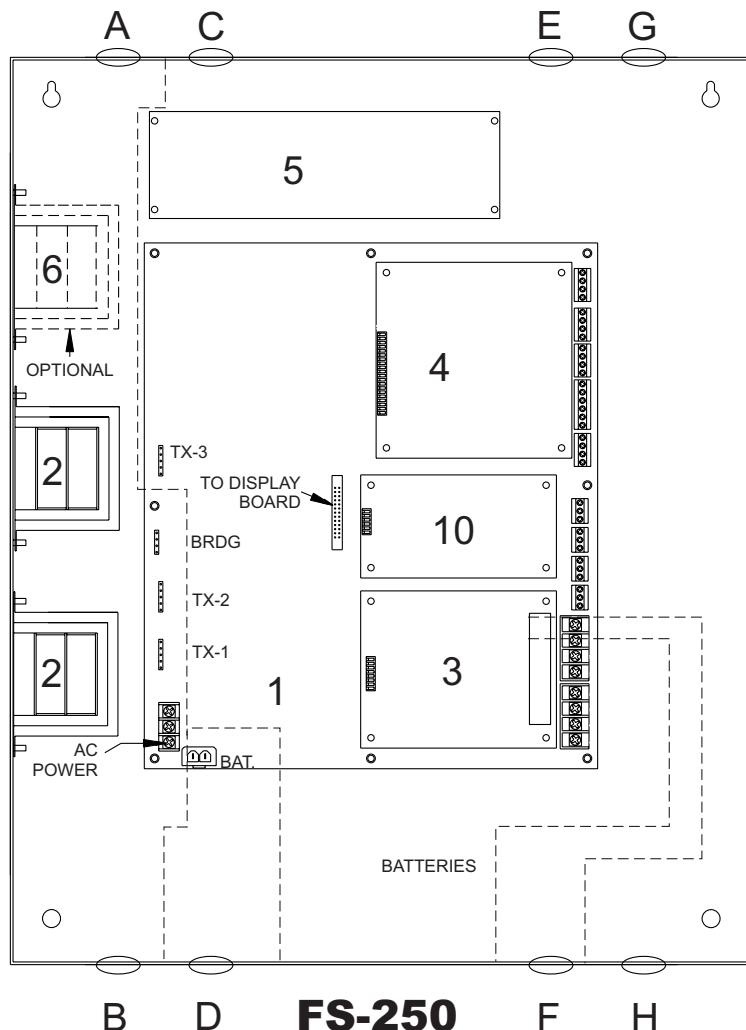
- Remove the knockouts in the backbox for the entry of field wiring. (Refer to Enclosure Mounting Pictures on preceding page and Wiring Separation Diagram on next page for the location of knockouts.)
- Pull all field wiring into the backbox. Do not dress the wiring until the location of all the equipment is known.

Install the wiring from the external power source to the approximate location of the power supply.

The overall arrangement of boards in the control panel is shown in the following diagram.

Wiring Separation

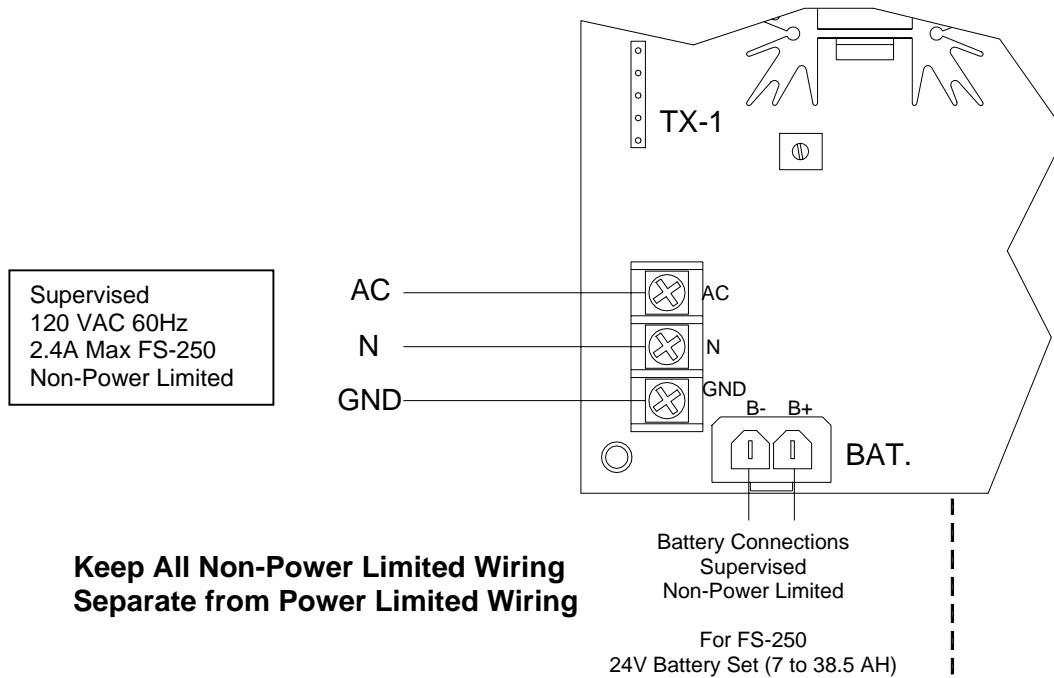
All high voltage and non-power limited wiring must be kept separate from power limited wiring. A separation of at least a 1/4 inch must be maintained, with high voltage and non-power limited wiring running in separate conduit openings from power limited wiring.



- | | | |
|----|---|--|
| A. | Non-power limited - High Voltage
(AC power) or B | 1. Main Board |
| B. | Non-power limited - High Voltage
(AC power) or A | 2. FS-NPE Transformer |
| C. | Power limited | 3. FS-DACT Board or FS-MT Municipal Tie |
| D. | Non-power limited
(Battery If external enclosure required) | 4. FS-DLC Loop Driver Board
(requires Main Board) |
| E. | Power limited | 5. Future Expansion |
| F. | Non-power limited if
Local Energy Box used | 6. FS-NPE Expansion Transformer |
| G. | Power limited or F or H | 10. Future Expansion – 485 Module |
| H. | Power limited or F or G | |

Primary And Secondary Power Wiring

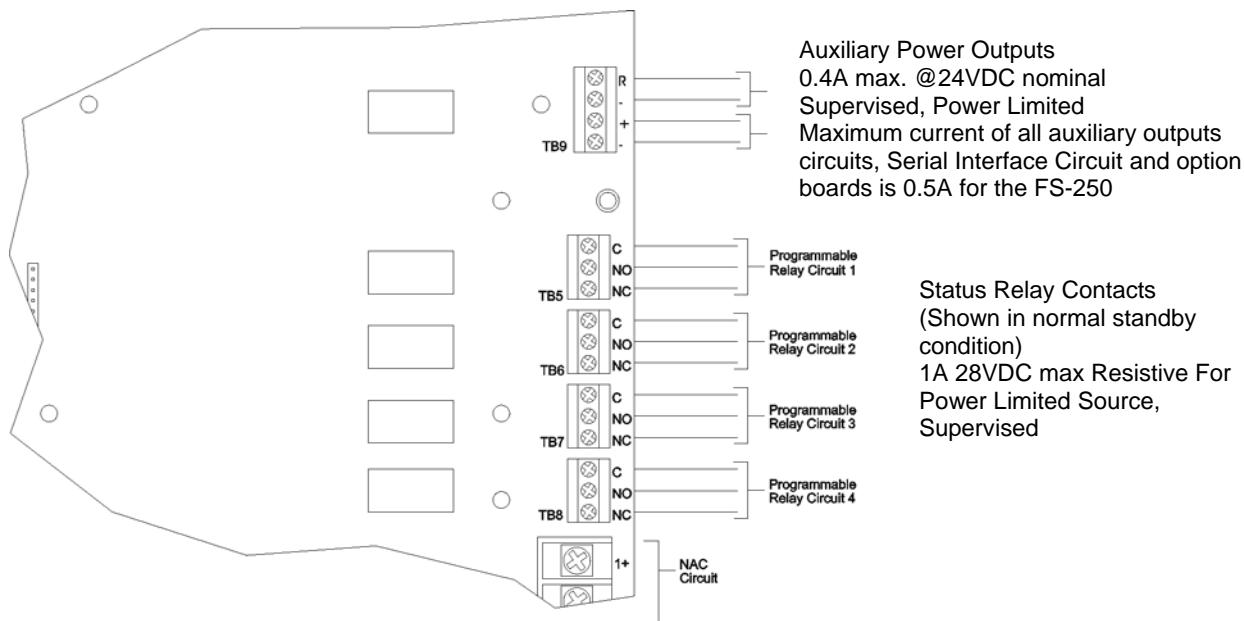
The AC main connections (TB1) and the battery connections (J4) must be made along the left-hand side of the main termination board. Route all high voltage and non-power limited wiring together and away from power limited wiring.



Status Relays And Auxiliary Power Outputs Wiring

The right side of the main board provides for connection of status relay contacts and auxiliary power connections (TB5-8). Four relays with dry contacts are provided. These contacts can be dedicated to power fail, alarm, trouble and supervisory indications. The relay contacts are Form C and are rated 1A @ 28VDC resistive.

The right-hand edge of the main termination board (TB9) provides for resettable and non-resettable auxiliary power connections.



FS-250 System Power Requirements (Does not include NAC power)

Device	Item Max.(Amps)	FS-250 Amps
FS-250 Control panel (inc. 1 FS-DLC)	0.190	0.190
Addressable Device Circuit Power	# of Devices X 0.0018 Amps	
Auxiliary Power Outputs *	Depends on devices installed	
FS-MT Municipal Tie Board	0.055	
FS-DACT DACT Board	0.054	
FS-RD2 Remote LCD Annunciator *	0.085	
FS-RU2/FS-RE8 Serial Relay Unit *	0.032+0.020 A for each relay	
FS-SAU2/FS-SAE16 Serial Annunciator Unit *	0.070+ load of each LED or lamp	
Total current requirements		
Must be less than or equal to		0.75

Auxiliary Power Supply

*Connect a PAD-3 auxiliary supply when power requirement calculation indicates that an additional source is required. For further information, refer to Appendix D.

Battery Size Calculations

For calculation of battery size requirements see Appendix A.

NAC Wiring

At the lower right corner of the main board are the terminal blocks (TB12, TB13) are used for the connection of notification appliances. Four individual NACs marked 1 through 4 are provided and the polarity shown is when the NAC is activated.

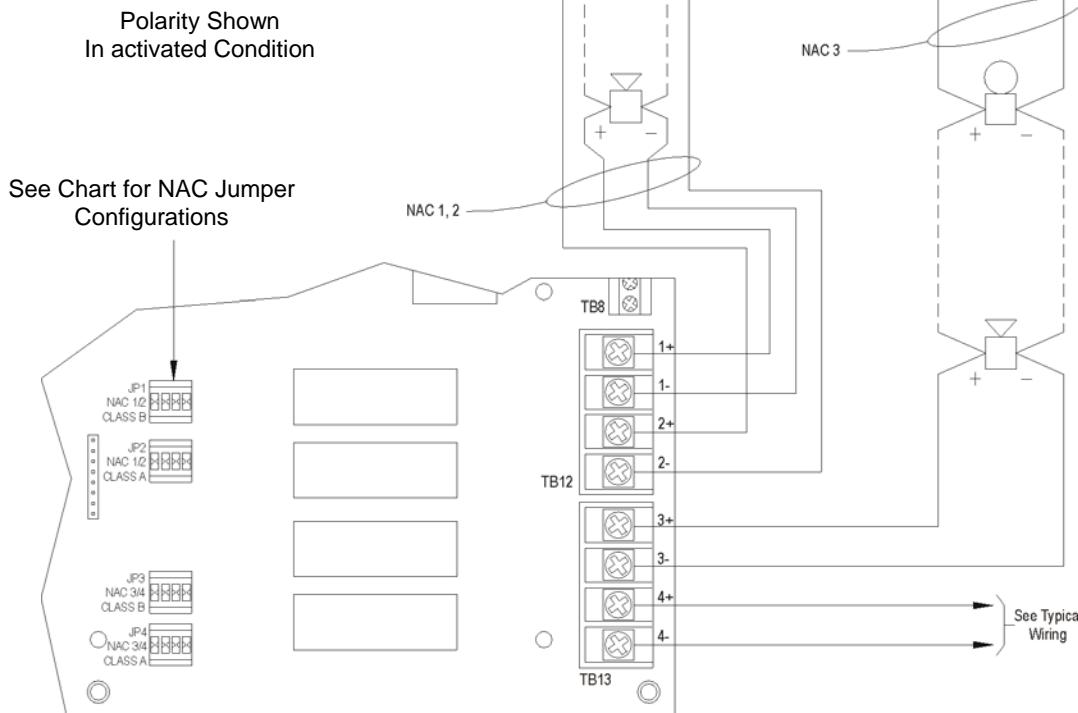
NAC Rating:

Alarm Voltage: 24V FW nominal
Max. Alarm Current: 1.5A/NAC circuit
Max. Ripple: 16VAC
Max. Wire Voltage Drop: 1.0VDC
Max. Standby Current: 1.0mA

NOTE: The maximum total current for the FS-250 NACs is 3.0A and 6.0A with the optional additional FS-NPE Transformer.

Typical Notification Appliance Circuit
Style Z, Class A
Supervised, Power Limited
See Appendix B for Compatible Devices

Typical Notification Appliance Circuit
Style Y, Class B
Supervised, Power Limited
See Appendix B for Compatible Devices

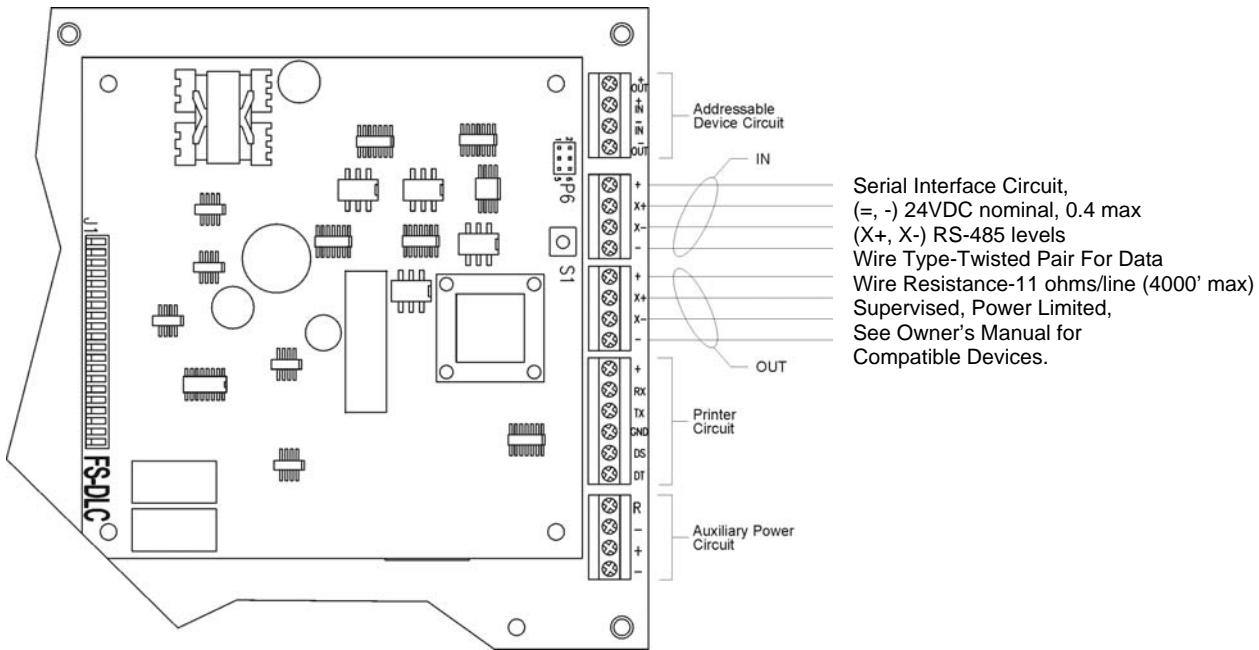


Use the following table to configure the NACs for either class A or class B operation.

NAC #s	Class "B" Operation	Paired Class "A" Operation
1,2	JP1	JP2
3,4	JP3	JP4

Serial Interface Circuit

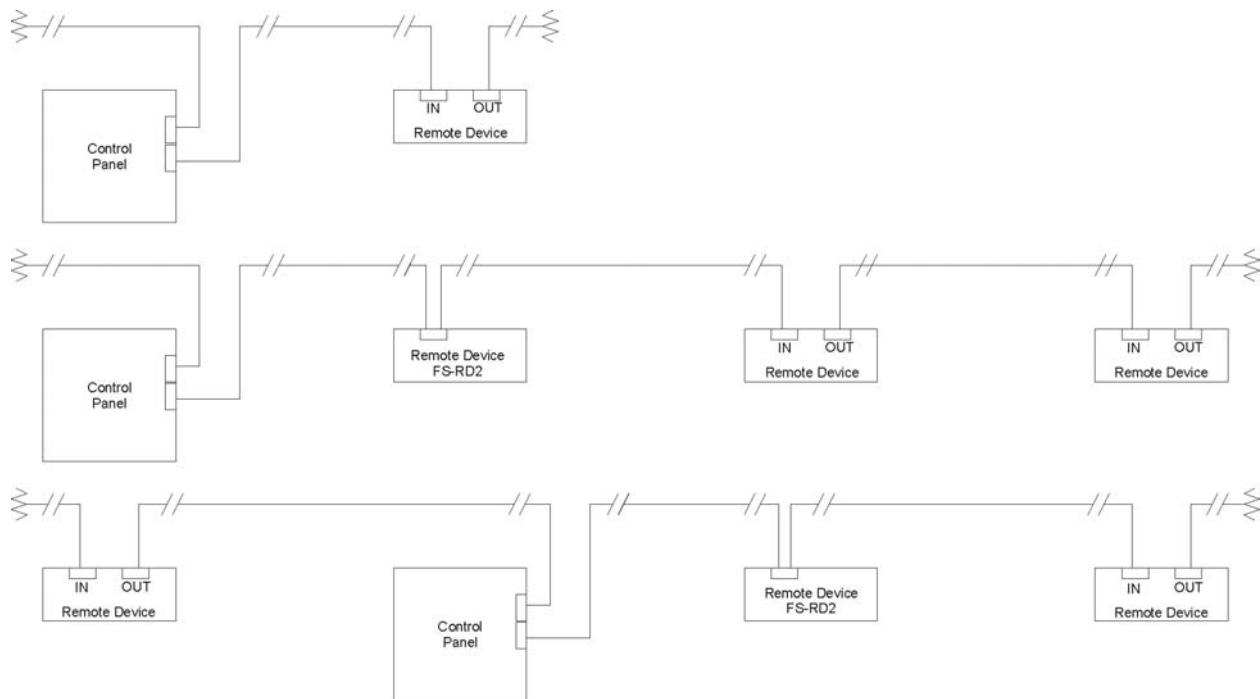
The serial interface circuit can address up to 16 standard annunciators and/or 8 remote processors to drive graphic annunciation or relay modules. Devices on the circuit may be connected up to 4000 feet from the control panel. At the top of the main board, the terminal blocks are used for the connection of remote serial devices.



- **Remote Device Power** - When connecting devices on the serial interface circuit, a limited amount of current is available from the control panel. If more current supply is required for the connected devices, auxiliary power must be provided to each insufficiently powered device. Each address on the circuit must be fully powered from either control panel or auxiliary power (*no combined source can be configured*).

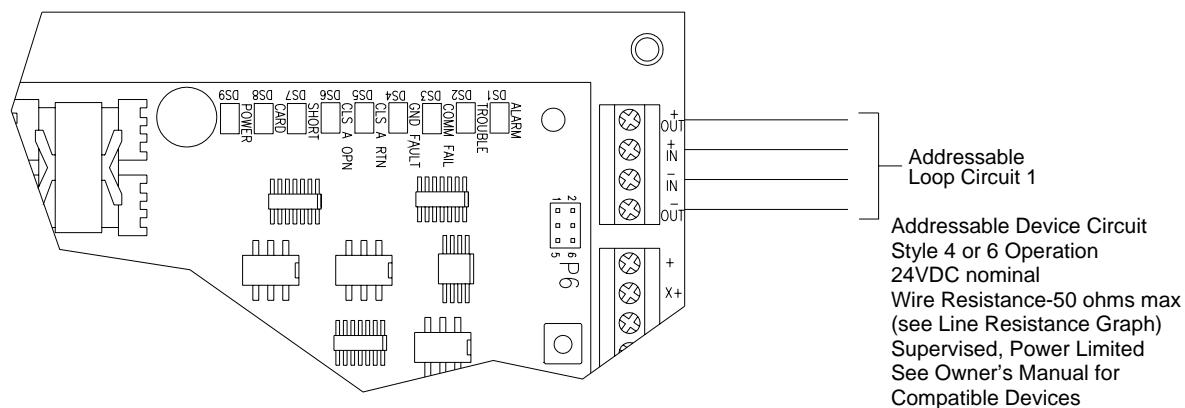
Serial Remote Device Wiring Overview

When connecting devices on the Serial Interface Circuit, the data wires must be daisy chained and with no T-taps to preserve the integrity of the data. Each end (two places) must be terminated with a 120 ohm termination resistor. The following diagrams show the proper wiring.



P2 Addressable Device Circuit(s)

These devices are polled by the control panel every few seconds and input or output functions communicated to determine device status or function. The control panel monitors all device addresses for alarm and trouble conditions.



FS-250 - P2 ADDRESSABLE DEVICE CIRCUIT

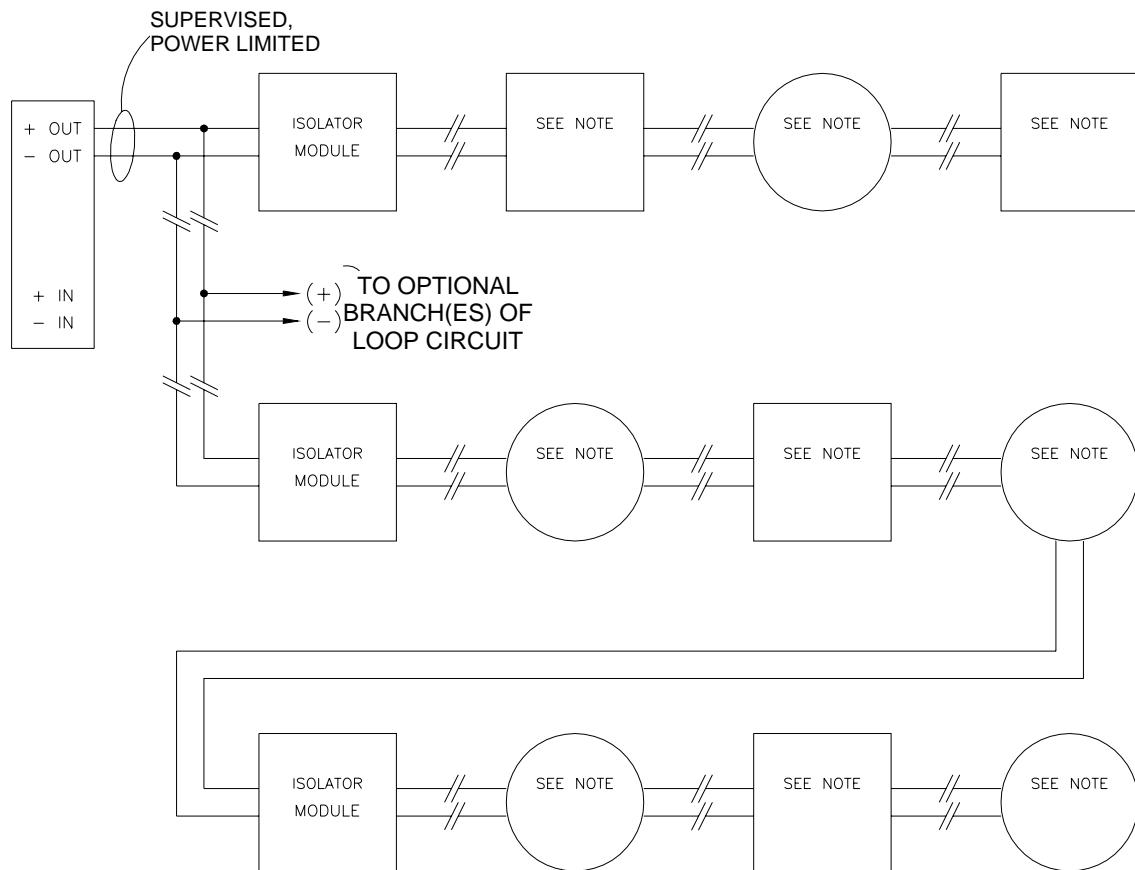
P2 Addressable Device Wiring Diagrams

Refer to the instruction sheets packed with each device.

Detectors and modules may be wired together according to several NFPA defined wiring styles. The wiring style that is appropriate for your installation should be determined from the relevant building codes and the Authority Having Jurisdiction.

Style 4 wiring permits branching of circuit connections. The control equipment supervises modules because they are active and must respond periodically to the control panel's interrogation.

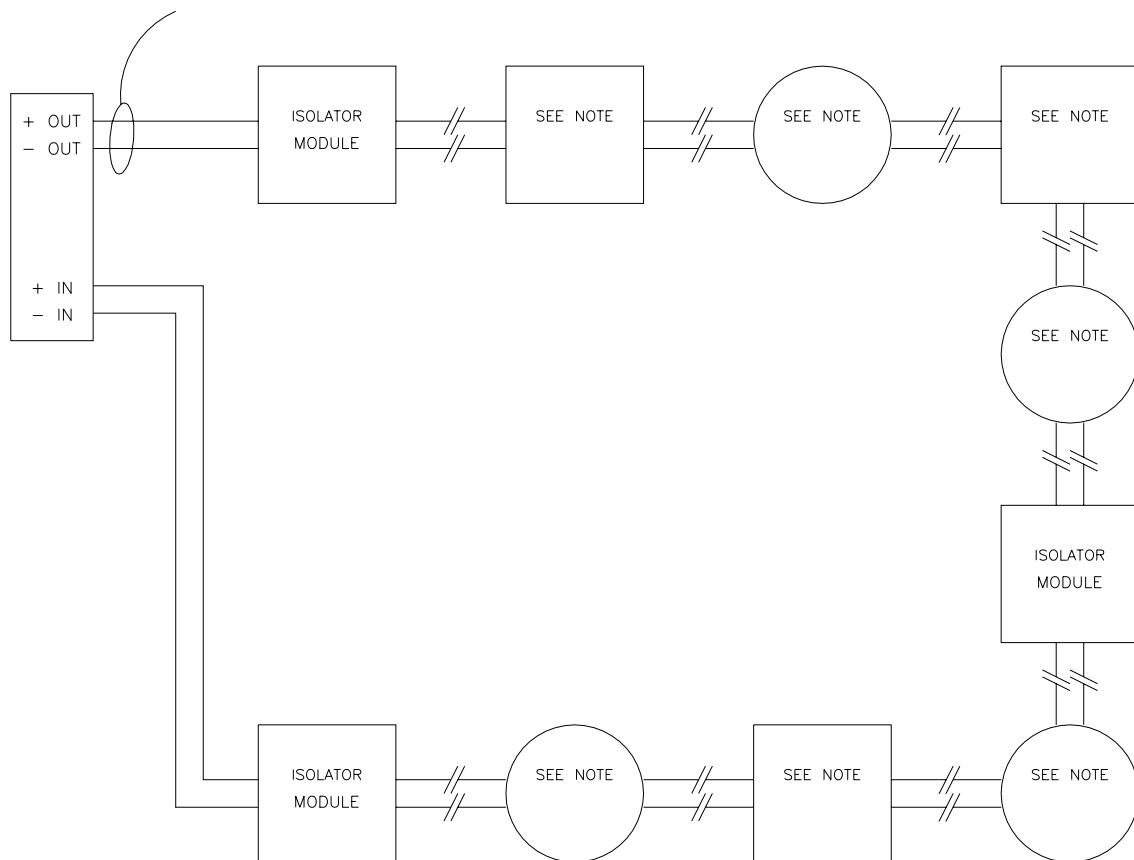
P2 ADDRESSABLE DEVICE CIRCUIT WIRING / OPERATION COMPARABLE TO NFPA STYLE 4



Siemens P2 Devices: Detectors, Monitor Modules, or Control Modules up to a maximum of 252 devices per addressable device circuit. A Maximum of 20 devices recommended per Isolator Module. A Maximum of 15 Isolator Modules per addressable device circuit.

P2 ADDRESSABLE DEVICE CIRCUIT WIRING / OPERATION COMPARABLE TO NFPA STYLE 6

Style 6 provides redundant communication paths.



Siemens P2 Devices: Detectors, Monitor Modules, or Control Modules up to a maximum of 252 devices per addressable device circuit. A Maximum of 20 devices recommended between Isolator Modules. A Maximum of 15 Isolator Modules per addressable device circuit.

PROGRAMMING THE CONTROL PANEL

KEYPAD PROGRAMMING

Customized programming of the control panel may be accomplished through a keypad included in the control panel. See the Siemens FS-250 Programmer's Manual, P/N 315-049403, for detailed information of system programming.

PC PROGRAMMING

Programming the panel may also be done by a temporary connection to the programming port with a computer.

The **SIEMENS** FS-CT2 software is available to allow programming the control panel by connection to a Personal Computer (PC) with an EIA-232 port. This allows ease of operation by preparing the program in advance and downloading to the control panel in a simple, rapid operation.

Uploading or downloading of a configuration requires the tech level. The control panel automatically verifies a downloaded configuration for regulatory and system restriction compliance. After verifying the new configuration, a comparison of the new and old configurations may be printed. Switchover to the new configuration requires confirmation at the control panel. See the **SIEMENS** Online Help for detailed information of system programming.

PROGRAMMING SECURITY

The following levels of security protect the system from unauthorized use:

- User – Locked Door
- Maintenance – Locked Door and 4-digit Maint. Password
- Technician – Locked Door and 5-digit Tech Password

The User and Maintenance Levels are also accessible from the Remote LCD Annunciators.

MAINTENANCE

GENERAL

Device sensitivity may be read out and alarm thresholds controlled on a per-point basis, as well as setting overall percent obscuration and day/night variations. Individual points may also be disabled for service.

To perform these functions on the unit, enter the 4-digit maintenance password into the control panel or LCD annunciator. When the menu is displayed, select the desired function or sub-function and press the appropriate operating button. When the function is complete, the menu will provide a command for exiting the maintenance mode.

Note that any abnormal condition, such as disabled points, will report a trouble. Confirmation of disabling or re-enabling a point is required to complete the action, but acknowledgment of the trouble is not required, since it results from operator action.

Activation of an alarm condition or a timeout after no button activity terminates Maintenance mode.

The system may automatically scan the operating points and report to a printer, facilitating NFPA 72 test requirements. The control panel may perform this scan once a day, with the time selectable by the user.

To initiate a non-programmed automatic test cycle, enter the 4-digit maintenance password into the control panel or LCD annunciator. When the menu is displayed, select Auto-test and press the associated switch. The Auto-test cycle will be completed and the control panel will return to normal. Results will be displayed on the display (anomalies only) or the printer (full data) according to the selected mode.

- The system will automatically monitor drift of quiescent detector output levels and report a maintenance alert if a preset level is passed, or if a detector drifts too quickly. This maintenance alert is annunciated as a trouble.
- The system may be programmed to report the number of times the alarm verify function is initiated by device, time of day, and/or day of week, allowing location of environmental problems. This datum is available on the display as described in paragraph 1 above.
- The system may be programmed to alert the operator when scheduled maintenance is required.
- A 2000 event history is maintained, with all events available for chronological review at the operator level. This history may be cleared only with the Maintenance Level Code. For details on included data and use of the history, see operation instructions.

To clear history when data has been read out and restoration of memory space is desired, activate maintenance mode as described above and follow menu instructions for clearing the event history.

QUICK TEST



If the control panel has remote connections to the Fire Department or other monitor, be sure to disable the remote signals and notify the remote monitoring station before performing test operations, since an off-normal condition will be indicated.

Quick test is possible in one of two modes, (silent or audible) and is selectable on a per-zone basis. Any number of zones may be placed into test at the same time, but only one mode of quick test operation is possible for the whole system at one time. Points not in quick test operate normally. Quick test operation initiates a system trouble condition.

In the silent mode, all alarm outputs are disabled and only the front panel indications and remote annunciator LEDs operate. In the audible mode all system sounders will sound momentarily as each device is alarmed.

The system maintains a counter of the number of activations during the quick test and reports this value when quick test mode is exited.

Quick test terminates into alarm if more than one device activates simultaneously, or if a device does not return to normal after being activated within a configurable length of time.

Quick test terminates automatically into normal standby mode using a timer. The value of the timer is configurable. The timer can be configured to limit the total time of the quick test (i.e. the timer is started only when quick test is entered), or to limit the time between device activations (i.e. the timer is re-started after each activation).

Alarm activations that occur in a system or zone in quick test or by a point in quick test cause the event to be logged and printed. No other action is taken.

To initiate quick test, enter maintenance mode as described above and follow menu instructions to configure and initiate the test.

Initiation of General Evacuation from the control panel, an RS485 LCD Announcer, or an RS485 Remote Processor causes termination of quick test and starts the normal alarm sequence.

Quick test may be terminated by a menu selection or by timeout (set at 5 to 30 minutes) from the last test activation. Timeout system reactivation is annunciated by a 1/2 second on, 1/2 second off pattern from system sounders programmed for drill use. A device in alarm condition when quick test is exited causes the normal alarm sequence.



When any problem is observed with the system, refer to the troubleshooting chart in Appendix C. For any required service, contact a factory-authorized representative.

APPENDIX-A: REFERENCE DATA

This appendix provides reference for the following topics:

- Wire selection guides
- Battery size calculations
-

WIRE SELECTION GUIDES

Resistance of Solid Copper Wire

AWG	Ohms per Thousand Feet*
18	8.08
16	5.08
14	3.19
12	2.01

*NEC Chapter 9, Table 8.

Notification Appliance Circuit Wire Selection Guide

Each Notification Appliance Circuit must not have a voltage drop greater than 1 volt. The following chart is based on these premises:

- The entire load is at the end of the wire run (worst case).
- Resistance is of solid copper wire.

Contact your local distributor or the factory if further information is needed in your circumstances.

Maximum Wire Loop Distance (Feet)

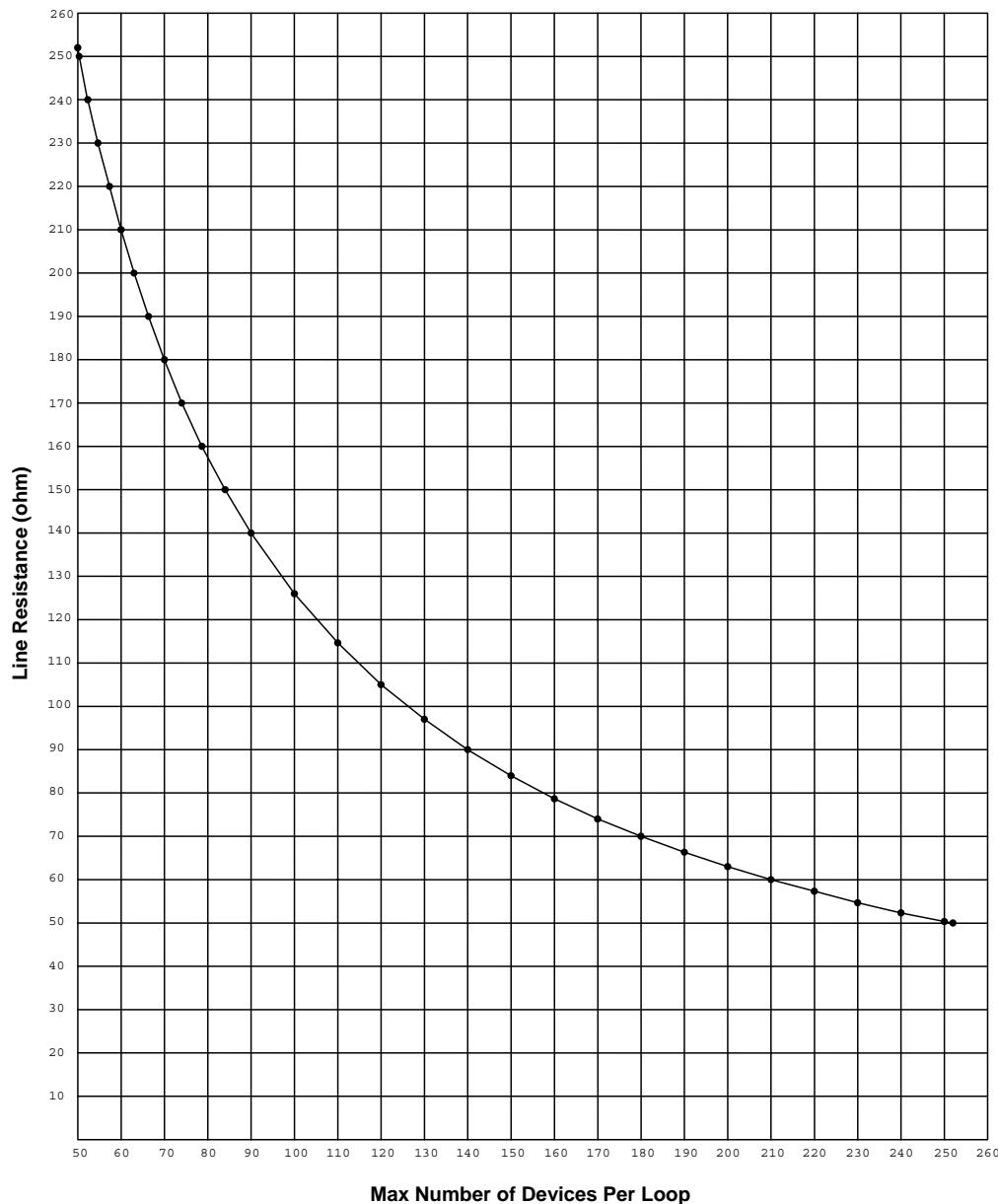
Signal Load (A)	18 AWG	16 AWG	14 AWG	12 AWG
0.1	1,237	1968	3134	4975
0.25	495	787	1253	1990
0.5	247	393	626	995
0.75	165	262	417	663
1.0	123	196	313	497
1.25	99	157	250	398
1.5	82	131	208	331

Addressable Device Circuit Wire Selection Guide

Each addressable device circuit must meet the following requirements:

- Total loop resistance - 50 ohm maximum with 252 devices.(refer to following graph)
- Total loop capacitance - 0.5uF max line to line and 1.0uF max line to shield

Line Resistance Graph



FDLC LINE RESISTANCE vs MAX NUMBER OF DEVICES

Note: The total number of devices can not exceed 252.
 The line resistance of each loop can also be calculated by using $R=1260/N$.
 R is line resistance and N is the number of devices in the loop.



The terminal blocks of Siemens P2 devices are rated for a maximum of 14AWG wire.

BATTERY SIZE CALCULATONS

FS-250 Current Calculations

Panel and Module Current			Standby Current (A.)	Alarm Current (A.)
FS-250 Control Panel (includes one loop driver board)*			0.190	0.190
FS-MT Municipal Tie	Standby 0.005	0.005	+	NA
	Alarm 0.028	0.028	NA	+
	Standby (note 5)		+	NA
	Alarm (note 5)		NA	+
FS-DACT DACT Board	Standby 0.038	0.038	+	NA
	Alarm 0.054	0.054	NA	+
Total Panel currents				

Place these totals in the Total System Current Table

Go to Auxiliary Module Current calculations

When using the FS-MT Municipal Tie Board add the following currents for standby and alarm:

Type of Municipal tie Connection	Standby	Alarm
Local Energy	+ 0	+ 0
Reverse Polarity Alarm Output (CA)		
Alarm	+ 0.020	+ 0.020
Alarm w/Trouble	+ 0	+ 0.020
Reverse Polarity Trouble Output (CT)	+ 0.020	+ 0.020

Auxiliary Module Battery Calculations

Panel and Module Current			Standby Current (A.)	Alarm Current (A.)
FS-RD2 Remote Annunciator	Standby 0.020	X =	+	NA
	Alarm 0.085	X =	NA	+
FS-RU2 Serial Relay Unit	Standby 0.032	X =	+	NA
	Alarm 0.192	X =	NA	+
FS-RE8 Serial Relay Extender	Standby 0.000	X =	+	NA
	Alarm 0.160	X =	NA	+
FS-SAU2 Serial Annunciator Unit	Standby 0.018	X =	+	NA
	Alarm (note 4) 0.070	X =	NA	+
FS-SAE16 Serial Annunciator Extender	Standby 0.005	X =	+	NA
	Alarm (note 4) 0.000	X =	NA	+
Total Auxiliary Module Current				

Place these totals in the Total System Current table

Go to Device Current Calculations

Device Current Calculations

Device Current				
Catalog #	Quantity	X Current (A.)	Standby Current (A.) Alarm Current (A)	
	Standby	X =	+	NA
	Alarm	X =	NA	+
	Standby	X =	+	NA
	Alarm	X =	NA	+
	Standby	X =	+	NA
	Alarm	X =	NA	+
	Standby	X =	+	NA
	Alarm	X =	NA	+
4-wire Smoke Detectors				
Catalog #	Quantity	X Current (A.)		
	Standby	X =	+	NA
	Alarm	X =	NA	+
	Standby	X =	+	NA
	Alarm	X =	NA	+
End of Line Relay				
Catalog #	Quantity	X Current (A.)		
		X =	+	+
Notification Appliances				
Catalog #	Quantity	X Current (A.)		
		X =	NA	+
		X =	NA	+
		X =	NA	+
		X =	NA	+
Other	=		+	+
TOTAL DEVICE Current				

Place these totals in the Total System Current table

Go to Total System Current Calculations

Total System Currents

		STANDBY (A)	ALARM (A)
Total Panel and Modules current			
Total Auxiliary current		+	+
Total Device current		+	+
TOTAL PANEL+ Modules + DEVICES			

Use the **Total Panel+ Modules + Devices** for the Battery Size Calculations

Battery Size

Total Standby Current (from above)	Hours of Standby Required per NFPA 72 Standard (4, 24 or 60)	AH for Standby
A.	x ____ Hours	=

Total Alarm Current (from above)	5 Minutes of Alarm Operation per NFPA 72 Standard*	AH for Alarm
A.	x 0.33 Hours	=

A.H. for Standby	A.H. for Alarm	Calculated A.H.	De-rating Factor	A.H. Required Battery Capacity
	+	=	X 1.25	=

Notes:

1. An additional multiplier is included to compensate for the higher discharge rate in alarm. Battery capacity decreases with age.
2. The Standby current + Alarm current must never exceed 3.0 Amps when using one Transformer, and 6.0amps when using the FS-NPE optional transformer assembly.
3. The following states the maximum standby current allowed for a FS-250 panel using a 38.5 AH battery set:
 - 60 hours of standby time is 0.457 Amps
 - 24 hours of standby time is 1.144 Amps
4. Does not include lamp or LED current, add separately. Refer to FS-SAU2 Installation Instructions for maximum activated current rating of individual drive circuits.

APPENDIX-B: COMPATIBLE DEVICES

DEVICES FOR ADDRESSABLE DEVICE CIRCUITS

Siemens P2 Manual Pull Stations

Siemens Cat. No.	Description
HMS-S	Manual Station, Single Action
HMS-D	Manual Station , Dual Action
HMS-M	Metal Manual Station , Single Action

Siemens P2 Modules

Siemens Cat. No.	Description
HTRI-M	Transmit-Receive Interface - Mini- Module
HTRI-S	Transmit-Receive Interface - Single Monitor Circuit
HTRI-D	Transmit-Receive Interface - Dual Monitor Circuit
HTRI-R	Transmit-Receive Interface - Dual Monitor Circuit with Programmable Relay
HZM	Conventional Zone Module
HLIM	Line Isolator Module

Siemens P2 Photo Electric Detectors

Siemens Cat. No.	Description
HFPO-11	Photo Detector
HFPT-11	Thermal Detector, Fixed Temperature or Fixed/Rate of Rise
HPT-11	FirePrint™ Photo/Thermal Detector

Siemens P2 Bases

Siemens Cat. No.	Description
DB-11	Standard Base
ADBH-11	Audible Base
DB-HR	Relay Base
AD-11P	Standard Duct Housing
AD-HR	Duct Housing with Relay

Siemens P2 Accessories

Siemens Cat. No.	Description
ILED-C	Intelligent Remote Lamp, Ceiling mount
ILED-W	Intelligent Remote Lamp, Wall mount
RL-HC	Remote Lamp, Ceiling mount
RL-HW	Remote Lamp, Wall mount

Notes:

1. Siemens P2 devices, detectors and modules, up to a maximum of 252 addresses may be used per addressable P2 FS-DLC Loop Driver Circuit.
2. For specific wiring and installation information, read the instructions provided with each device.

DEVICES FOR NOTIFICATION APPLIANCE CIRCUITS

Notification Appliances

SIEMENS CATALOG #	DESCRIPTION	AUDIBLE VOLTAGE (VOLTS)	AUDIBLE CURRENT (AMPS)	STROBE VOLTAGE (VOLTS)	STROBE CURRENT (AMPS)
BT-F BF-F CH-F BS-F	Bell - Vibrating	21-30 DC	0.110		
BT-F BF-F CH-F BS-F	Bell - Vibrating	21-30 DC	0.070		
BT-SS BF-SS CH-SS BS-SS	Bell - Single Stroke	21-30 DC	0.360		
U-MCS U-MCS-W U-MCS-AR U-MCS-WE	Adapter Strobe			16-33 DC	0.112-0.323
U-S17 U-S17-W U-S17-C U-S17-W-C U-S17-AC U-S17-AC-W U-S17-AC-C U-S17-AC-W-C	Strobe Light			20-31 DC	0.059
U-S30 U-S30-W U-S30-C U-S30-W-C U-S30-AC U-S30-AC-W U-S30-AC-C U-S30-AC-W-C	Strobe Light			20-31 DC	0.089
U-S60 U-S60-W U-S60-C U-S60-W-C U-S60-AC U-S60-AC-W U-S60-AC-C U-S60-AC-W-C	Strobe Light			20-31 DC	0.155
U-S75 U-S75-W U-S75-C U-S75-W-C U-S75-AC U-S75-AC-W U-S75-AC-C U-S75-AC-W-C	Strobe Light			20-31 DC	0.164
U-S110 U-S110-W U-S110-C U-S110-W-C U-S110-AC U-S110-AC-W U-S110-AC-C U-S110-AC-W-C	Strobe Light			20-31 DC	0.249

SIEMENS CATALOG #	DESCRIPTION	AUDIBLE VOLTAGE (VOLTS)	AUDIBLE CURRENT (AMPS)	STROBE VOLTAGE (VOLTS)	STROBE CURRENT (AMPS)
U-S17S U-17S-W U-S17S-C U-S17S-W-C	Sync Strobe Light			20-31 DC	0.059
U-S30S U-S30S-W U-S30S-C U-S30S-W-C	Sync Strobe Light			20-31 DC	0.088
U-S60S U-S60S-W U-S60S-C U-S60S-W-C	Sync Strobe Light			20-31 DC	0.154
U-S75S U-S75S-W U-S75S-C U-S75S-W-C	Sync Strobe Light			20-31 DC	0.17
U-S110S U-S110S-W U-S110S-C U-S110S-W-C	Sync Strobe Light			20-31 DC	0.249
U-MCS-6090V U-MCS-6090V-W	Adapter Strobe			16-33 DC	0.112-0.323
U-S17-6090V U-S17-6090V-W U-S17-6090V-AC U-S17-6090V-AC-W	Strobe Light			20-31 DC	0.059
U-S30-6090V U-S30-6090V-W U-S30-6090V-AC U-S30-6090V-AC-W	Strobe Light			20-31 DC	0.089
U-S60-6090V U-S60-6090V-W U-S60-6090V-AC U-S60-6090V-AC-W	Strobe Light			20-31 DC	0.155
U-S75-6090V U-S75-6090V-W U-S75-6090V-AC U-S75-6090V-AC-W	Strobe Light			20-31 DC	0.164
U-S110-6090V U-S110-6090V-W U-S110-6090V-AC U-S110-6090V-AC-W	Strobe Light			20-31 DC	0.249
U-S17S-6090V U-S17S-6090V-W	Sync Strobe Light			20-31 DC	0.059
U-S30S-6090V U-S30S-6090V-W	Sync Strobe Light			20-31 DC	0.088
U-S60S-6090V U-S60S-6090V-W	Sync Strobe Light			20-31 DC	0.154
U-S75S-6090V U-S75S-6090V-W	Sync Strobe Light			20-31 DC	0.17
U-S110S-6090V U-S110S-6090V-W	Sync Strobe Light			20-31 DC	0.249

SIEMENS CATALOG #	DESCRIPTION	AUDIBLE VOLTAGE (VOLTS)	AUDIBLE CURRENT (AMPS)	STROBE VOLTAGE (VOLTS)	STROBE CURRENT (AMPS)
U-S17-1 U-S17-1-C U-S17-1-W U-S17-1-W-C U-S17-1-AC U-S17-1-AC-W U-S17-1-AC-C U-S17-1-AC-W-C	Strobe Light			20-31 DC	0.059
U-S110-1 U-S110-1-C U-S110-1-W U-S110-1-W-C U-S110-1-AC U-S110-1-AC-W U-S110-1-AC-C U-S110-1-AC-W-C	Strobe Light			20-31 DC	0.249
U-S17S-1 U-S17S-1-C U-S17S-1-W U-S17S-1-W-C	Sync Strobe Light			20-31 DC	0.059
U-S110S-1 U-S110S-1-C U-S110S-1-W U-S110S-1-W-C	Sync Strobe Light			20-31 DC	0.249
U-MHST-1G U-MHST-1G-W	Sync Electronic Horn	20-31 DC	0.030		
U-MHST U-MHST-W	Sync Electronic Horn	20-31 DC	0.030		
U-MHST-MCS U-MHST-MCS-W	Sync Electronic Horn w/Sync Strobe	20-31 DC	0.030	20-31 DC	
U-MHST-S17S U-MHST-S17S-W U-MHST-S17S-C U-MHST-S17S-W-C	Sync Electronic Horn w/Sync Strobe	20-31 DC	0.030	20-31 DC	0.059
U-MHST-S30S U-MHST-S30S-W U-MHST-S30S-C U-MHST-S30S-W-C	Sync Electronic Horn w/Sync Strobe	20-31 DC	0.030	20-31 DC	0.088
U-MHST-S60S U-MHST-S60S-W U-MHST-S60S-C U-MHST-S60S-W-C	Sync Electronic Horn w/Sync Strobe	20-31 DC	0.030	20-31 DC	0.154
U-MHST-S75S U-MHST-S75S-W U-MHST-S75S-C U-MHST-S75S-W-C	Sync Electronic Horn w/Sync Strobe	20-31 DC	0.030	20-31 DC	0.17
U-MHST-S110S U-MHST-S110S-W U-MHST-S110S-C U-MHST-S110S-W-C	Sync Electronic Horn w/Sync Strobe	20-31 DC	0.030	20-31 DC	0.249
U-MHU-1G U-MHU-1G-W	Sync/Non Sync Electronic Horn	20-31 DC	0.030		
U-MHUU-MHU-W	Sync/Non Sync Electronic Horn	20-31 DC	0.030		
U-MHU-MCS U-MHU-MCS-W	Sync/Non Sync Elec Horn w/Adapter	20-31 DC	0.030	16-33 DC	0.112-0.323
U-MMT-1G U-MMT-1G-W	Electronic Signal-8T	20-31 DC	0.024-0.050 (*4)		

SIEMENS CATALOG #	DESCRIPTION	AUDIBLE VOLTAGE (VOLTS)	AUDIBLE CURRENT (AMPS)	STROBE VOLTAGE (VOLTS)	STROBE CURRENT (AMPS)
U-MMT U-MMT-W U-MMT-AR	Electronic Signal-8T	20-31 DC	0.024-0.050 (*4)		
U-MMT-MCS U-MMT-MCS-W U-MMT-MCS-AR	Electronic Signal-8T w/Adapter	20-31 DC	0.024-0.050 (*4)	16-33 DC	0.112-0.323
U-MMT-S17 U-MMT-S17-W U-MMT-S17-C U-MMT-S17-W-C	Electronic Signal-8T w/Strobe	20-31 DC	0.024-0.050 (*4)	20-31 DC	0.059
U-MMT-S30 U-MMT-S30-W U-MMT-S30-C U-MMT-S30-W-C	Electronic Signal-8T w/Strobe	20-31 DC	0.024-0.050 (*4)	20-31 DC	0.089
U-MMT-S60 U-MMT-S60-W U-MMT-S60-C U-MMT-S60-W-C	Electronic Signal-8T w/Strobe	20-31 DC	0.024-0.050 (*4)	20-31 DC	0.155
U-MMT-S75 U-MMT-S75-W U-MMT-S75-C U-MMT-S75-W-C	Electronic Signal-8T w/Strobe	20-31 DC	0.024-0.050 (*4)	20-31 DC	0.164
U-MMT-S110 U-MMT-S110-W U-MMT-S110-C U-MMT-S110-W-C	Electronic Signal-8T w/Strobe	20-31 DC	0.024-0.050 (*4)	20-31 DC	0.249
U-MMT-S17S U-MMT-S17S-W U-MMT-S17S-C U-MMT-S17S-W-C	Electronic Signal-8T w/Sync Strobe	20-31 DC	0.024-0.050 (*4)	20-31 DC	0.059
U-MMT-S30S U-MMT-S30S-W U-MMT-S30S-C U-MMT-S30S-W-C	Electronic Signal-8T w/Sync Strobe	20-31 DC	0.024-0.050 (*4)	20-31 DC	0.088
U-MMT-S60S U-MMT-S60S-W U-MMT-S60S-C U-MMT-S60S-W-C	Electronic Signal-8T w/Sync Strobe	20-31 DC	0.024-0.050 (*4)	20-31 DC	0.154
U-MMT-S75S U-MMT-S75S-W U-MMT-S75S-C U-MMT-S75S-W-C	Electronic Signal-8T w/Sync Strobe	20-31 DC	0.024-0.050 (*4)	20-31 DC	0.17
U-MMT-S110S U-MMT-S110S-W U-MMT-S110S-C U-MMT-S110S-W-C	Electronic Signal-8T w/Sync Strobe	20-31 DC	0.024-0.050 (*4)	20-31 DC	0.249
MC-F	Electronic Horn-3T	21-32 DC	0.020-0.025 (*4)		
MC-S	Electronic Horn-3T	21-32 DC	0.020-0.025 (*4)		
MC-C	Electronic Horn-3T	21-32 DC	0.020-0.025 (*4)		
MT-F	Electronic Signal-8T	12-32 DC	0.020-0.050 (*4)		
MT-S	Electronic Signal-8T	12-32 DC	0.020-0.050 (*4)		
MT-C	Electronic Signal-8T	12-32 DC	0.020-0.050 (*4)		
MTL-F	Electronic Signal-8T	12-32 DC	0.020-0.050 (*4)		
MTL-S	Electronic Signal-8T	12-32 DC	0.020-0.050 (*4)		

SIEMENS CATALOG #	DESCRIPTION	AUDIBLE VOLTAGE (VOLTS)	AUDIBLE CURRENT (AMPS)	STROBE VOLTAGE (VOLTS)	STROBE CURRENT (AMPS)
MTL-C	Electronic Signal-8T	12-32 DC	0.020-0.050 (*4)		
U-EC	Electronic Chime	21-30 DC	0.020		
U-EC-MCS U-EC-MCS-W	Electronic Chime w/Adapter	21-30 DC	0.020	16-33 DC	0.112-0.323
U-EC-S17 U-EC-S17-W	Electronic Chime w/Strobe	21-30 DC	0.020	20-31 DC	0.059
U-EC-S30 U-EC-S30-W	Electronic Chime w/Strobe	21-30 DC	0.020	20-31 DC	0.089
U-EC-S60 U-EC-S60-W	Electronic Chime w/Strobe	21-30 DC	0.020	20-31 DC	0.155
U-EC-S75 U-EC-S75-W	Electronic Chime w/Strobe	21-30 DC	0.020	20-31 DC	0.164
U-EC-S110 U-EC-S110-W	Electronic Chime w/Strobe	21-30 DC	0.020	20-31 DC	0.249
U-EC-S175 U-EC-S175-W	Electronic Chime w/Sync Strobe	21-30 DC	0.020	20-31 DC	0.059
U-EC-S30S U-EC-S30S-W	Electronic Chime w/Sync Strobe	21-30 DC	0.020	20-31 DC	0.088
U-EC-S60S U-EC-S60S-W	Electronic Chime w/Sync Strobe	21-30 DC	0.020	20-31 DC	0.154
U-EC-S75S U-EC-S75S-W	Electronic Chime w/Sync Strobe	21-30 DC	0.020	20-31 DC	0.17
U-EC-S110S U-EC-S110S-W	Electronic Chime w/Sync Strobe	21-30 DC	0.020	20-31 DC	0.249
U-EC-C	Electronic Chime	21-30 DC	0.020		
U-EC-MCS-C	Electronic Chime w/Adapter	21-30 DC	0.020	16-33 DC	0.112-0.323
U-EC-S17-C	Electronic Chime w/Strobe	21-30 DC	0.020	20-31 DC	0.059
U-EC-S30-C	Electronic Chime w/Strobe	21-30 DC	0.020	20-31 DC	0.089
U-EC-S60-C	Electronic Chime w/Strobe	21-30 DC	0.020	20-31 DC	0.155
U-EC-S75-C	Electronic Chime w/Strobe	21-30 DC	0.020	20-31 DC	0.164
U-EC-S110-C	Electronic Chime w/Strobe	21-30 DC	0.020	20-31 DC	0.249
U-EC-S17S-C	Electronic Chime w/Sync Strobe	21-30 DC	0.020	20-31 DC	0.059
U-EC-S30S-C	Electronic Chime w/Sync Strobe	21-30 DC	0.020	20-31 DC	0.088
U-EC-S60S-C	Electronic Chime w/Sync Strobe	21-30 DC	0.020	20-31 DC	0.154
U-EC-S75S-C	Electronic Chime w/Sync Strobe	21-30 DC	0.020	20-31 DC	0.17
U-EC-S110S-C	Electronic Chime w/Sync Strobe	21-30 DC	0.020	20-31 DC	0.249
SCM-F	Sync Control panel	20-31 DC	0.020		
DSC DSC-W	Horn	21-30 DC	0.035		
HN-F	Horn	21-30 DC	0.038		
HN-S	Horn	21-30 DC	0.038		
HN-C U-HN-C	Horn	21-30 DC	0.038		

SIEMENS CATALOG #	DESCRIPTION	AUDIBLE VOLTAGE (VOLTS)	AUDIBLE CURRENT (AMPS)	STROBE VOLTAGE (VOLTS)	STROBE CURRENT (AMPS)
U-HN U-HN-W	Horn	21-30 DC	0.038		
U-HN-MCS U-HN-MCS-W	Horn w/Adapter	21-30 DC	0.038	16-33 DC	0.112-0.323
U-HN-S17 U-HN-S17-W	Horn w/Strobe	21-30 DC	0.038	20-31 DC	0.059
U-HN-S30 U-HN-S30-W	Horn w/Strobe	21-30 DC	0.038	20-31 DC	0.089
U-HN-S60 U-HN-S60-W	Horn w/Strobe	21-30 DC	0.038	20-31 DC	0.155
U-HN-S75 U-HN-S75-W	Horn w/Strobe	21-30 DC	0.038	20-31 DC	0.164
U-HN-S110 U-HN-S110-W	Horn w/Strobe	21-30 DC	0.038	20-31 DC	0.249
U-HN-S17S U-HN-S17S-W	Horn w/Sync Strobe	21-30 DC	0.038	20-31 DC	0.059
U-HN-S30S U-HN-S30S-W	Horn w/Sync Strobe	21-30 DC	0.038	20-31 DC	0.088
U-HN-S60S U-HN-S60S-W	Horn w/Sync Strobe	21-30 DC	0.038	20-31 DC	0.155
U-HN-S75S U-HN-S75S-W	Horn w/Sync Strobe	21-30 DC	0.038	20-31 DC	0.17
U-HN-S110S U-HN-S110S-W	Horn w/Sync Strobe	21-30 DC	0.038	20-31 DC	0.249
U-HN-S17-1 U-HN-S17-1-W U-HN-S17-1-C U-HN-S17-1-W-C	Horn w/Strobe-WP	21-30 DC	0.038	20-31 DC	0.059
U-HN-S110-1 U-HN-S110-1-W U-HN-S110-1-C U-HN-S110-1-W-C	Horn w/Strobe-WP	21-30 DC	0.038	20-31 DC	0.249
U-HN-S17S-1 U-HN-S17S-1-W U-HN-S17S-1-C U-HN-S17S-1-W-C	Horn w/Sync Strobe-WP	21-30 DC	0.038	20-31 DC	0.059
U-HN-S110S-1 U-HN-S110S-1-W U-HN-S110S-1-C U-HN-S110S-1-W-C	Horn w/Sync Strobe-WP	21-30 DC	0.038	20-31 DC	0.249
U-HN-MCS-C	Horn w/Adapter	21-30 DC	0.038	16-33 DC	0.112-0.323
U-HN-S17-C	Horn w/Strobe	21-30 DC	0.038	20-31 DC	0.059
U-HN-S30-C	Horn w/Strobe	21-30 DC	0.038	20-31 DC	0.089
U-HN-S60-C	Horn w/Strobe	21-30 DC	0.038	20-31 DC	0.155
U-HN-S75-C	Horn w/Strobe	21-30 DC	0.038	20-31 DC	0.164
U-HN-S110-C	Horn w/Strobe	21-30 DC	0.038	20-31 DC	0.249
U-HN-S17S-C	Horn w/Sync Strobe	21-30 DC	0.038	20-31 DC	0.059
U-HN-S30S-C	Horn w/Sync Strobe	21-30 DC	0.038	20-31 DC	0.088
U-HN-260S-C	Horn w/Sync Strobe	21-30 DC	0.038	20-31 DC	0.155
U-HN-S75S-C	Horn w/Sync Strobe	21-30 DC	0.038	20-31 DC	0.17
U-HN-S110S-C	Horn w/Sync Strobe	21-30 DC	0.038	20-31 DC	0.249
HNH-F	Horn	21-30 DC	0.065		
HNH-S	Horn	21-30 DC	0.065		
HNH-C U-HNH-C	Horn	21-30 DC	0.065		

SIEMENS CATALOG #	DESCRIPTION	AUDIBLE VOLTAGE (VOLTS)	AUDIBLE CURRENT (AMPS)	STROBE VOLTAGE (VOLTS)	STROBE CURRENT (AMPS)
U-HNH U-HNH-W	Horn	21-30 DC	0.065		
U-HNH-MCS U-HNH-MCS-W	Horn	21-30 DC	0.065		
U-HNH-S17 U-HNH-S17-W	Horn w/Adapter	21-30 DC	0.065	16-33 DC	0.112-0.323
U-HNH-S30 U-HNH-S30-W	Horn w/Strobe	21-30 DC	0.065	20-31 DC	0.059
U-HNH-S60 U-HNH-S60-W	Horn w/Strobe	21-30 DC	0.065	20-31 DC	0.089
U-HNH-S75 U-HNH-S75-W	Horn w/Strobe	21-30 DC	0.065	20-31 DC	0.155
U-HNH-S110 U-HNH-S110-W	Horn w/Strobe	21-30 DC	0.065	20-31 DC	0.164
U-HNH-S17S U-HNH-S17S-W	Horn w/Strobe	21-30 DC	0.065	20-31 DC	0.249
U-HNH-S30S U-HNH-S30S-W	Horn w/Sync Strobe	21-30 DC	0.065	20-31 DC	0.059
U-HNH-S60S U-HNH-S60S-W	Horn w/Sync Strobe	21-30 DC	0.065	20-31 DC	0.088
U-HNH-S75S U-HNH-S75S-W	Horn w/Sync Strobe	21-30 DC	0.065	20-31 DC	0.155
U-HNH-S110S U-HNH-S110S-W	Horn w/Sync Strobe	21-30 DC	0.065	20-31 DC	0.17
U-HNH-S17-1 U-HNH-S17-1-W U-HNH-S17-1-C U-HNH-S17-1-W-C	Horn w/Sync Strobe	21-30 DC	0.065	20-31 DC	0.249
U-HNH-S110-1 U-HNH-S110-1-W U-HNH-S110-1-C U-HNH-S110-1-W-C	Horn w/Strobe-WP	21-30 DC	0.065	20-31 DC	0.059
U-HNH-S17S-1 U-HNH-S17S-1-W U-HNH-S17S-1-C U-HNH-S17S-1-W-C	Horn w/Strobe-WP	21-30 DC	0.065	20-31 DC	0.249
U-HNH-S110S-1 U-HNH-S110S-1-W U-HNH-S110S-1-C U-HNH-S110S-1-W-C	Horn w/Sync Strobe-WP	21-30 DC	0.065	20-31 DC	0.059
U-HNH-MCS-C	Horn w/Sync Strobe-WP	21-30 DC	0.065	20-31 DC	0.249
U-HNH-S17-C	Horn w/Adapter	21-30 DC	0.065	16-33 DC	0.112-0.323
U-HNH-S30-C	Horn w/Strobe	21-30 DC	0.065	20-31 DC	0.059
U-HNH-S60-C	Horn w/Strobe	21-30 DC	0.065	20-31 DC	0.089
U-HNH-S75-C	Horn w/Strobe	21-30 DC	0.065	20-31 DC	0.155
U-HNH-S110-C	Horn w/Strobe	21-30 DC	0.065	20-31 DC	0.164
U-HNH-S17S-C	Horn w/Sync Strobe	21-30 DC	0.065	20-31 DC	0.059
U-HNH-S30S-C	Horn w/Sync Strobe	21-30 DC	0.065	20-31 DC	0.088
U-HNH-S60S-C	Horn w/Sync Strobe	21-30 DC	0.065	20-31 DC	0.155
U-HNH-S75S-C	Horn w/Sync Strobe	21-30 DC	0.065	20-31 DC	0.17
U-HNH-S110S-C	Horn w/Sync Strobe	21-30 DC	0.065	20-31 DC	0.249
MH-1G MH-1GW U-MH-1G U-MH-1G-W	Mini-Horn	20-31 DC	0.025		

SIEMENS CATALOG #	DESCRIPTION	AUDIBLE VOLTAGE (VOLTS)	AUDIBLE CURRENT (AMPS)	STROBE VOLTAGE (VOLTS)	STROBE CURRENT (AMPS)
MH-U MH-UW U-MH U-MH-W	Mini-Horn	20-31 DC	0.025		
U-MH-MCS U-MH-MCS-W	Mini-Horn w/Adapter	20-31 DC	0.025	16-33 DC	0.112-0.323
U-MH-S17 U-MH-S17-W U-MH-S17-C U-MH-S17-W-C	Mini-Horn w/Strobe	20-31 DC	0.025	20-31 DC	0.059
U-MH-S30 U-MH-S30-W U-MH-S30-C U-MH-S30-W-C	Mini-Horn w/Strobe	20-31 DC	0.025	20-31 DC	0.089
U-MH-S60 U-MH-S60-W U-MH-S60-C U-MH-S60-W-C	Mini-Horn w/Strobe	20-31 DC	0.025	20-31 DC	0.155
U-MH-S75 U-MH-S75-W U-MH-S75-C U-MH-S75-W-C	Mini-Horn w/Strobe	20-31 DC	0.025	20-31 DC	0.164
U-MH-S110 U-MH-S110-W U-MH-S110-C U-MH-S110-W-C	Mini-Horn w/Strobe	20-31 DC	0.025	20-31 DC	0.249
U-MH-S17S U-MH-S17S-W U-MH-S17S-C U-MH-S17S-W-C	Mini-Horn w/Sync Strobe	20-31 DC	0.025	20-31 DC	0.059
U-MH-S30S U-MH-S30S-W U-MH-S30S-C U-MH-S30S-W-C	Mini-Horn w/Sync Strobe	20-31 DC	0.025	20-31 DC	0.088
U-MH-S60S U-MH-S60S-W U-MH-S60S-C U-MH-S60S-W-C	Mini-Horn w/Sync Strobe	20-31 DC	0.025	20-31 DC	0.154
U-MH-S75S U-MH-S75S-W U-MH-S75S-C U-MH-S75S-W-C	Mini-Horn w/Sync Strobe	20-31 DC	0.025	20-31 DC	0.17
U-MH-S110S U-MH-S110S-W U-MH-S110S-C U-MH-S110S-W-C	Mini-Horn w/Sync Strobe	20-31 DC	0.025	20-31 DC	0.249
MHT-1G MHT-1GW U-MHT-1G U-MHT-1GW	Mini-Horn-S/T	20-31 DC	0.025		
MHT-U MHT-UW U-MHT U-MHT-W	Mini-Horn-S/T	20-31 DC	0.025		
U-MHT-MCS U-MHT-MCS-W	Mini-Horn-S/T w/Adapter	20-31 DC	0.025	16-33 DC	0.112-0.323
U-MHT-S17 U-MHT-S17-W U-MHT-S17-C U-MHT-S17-W-C	Mini-Horn-S/T w/Strobe	20-31 DC	0.025	20-31 DC	0.059

SIEMENS CATALOG #	DESCRIPTION	AUDIBLE VOLTAGE (VOLTS)	AUDIBLE CURRENT (AMPS)	STROBE VOLTAGE (VOLTS)	STROBE CURRENT (AMPS)
U-MHT-S30 U-MHT-S30-W U-MHT-S30-C U-MHT-S30-W-C	Mini-Horn-S/T w/Strobe	20-31 DC	0.025	20-31 DC	0.089
U-MHT-S60 U-MHT-S60-W U-MHT-S60-C U-MHT-S60-W-C	Mini-Horn-S/T w/Strobe	20-31 DC	0.025	20-31 DC	0.155
U-MHT-S75 U-MHT-S75-W U-MHT-S75-C U-MHT-S75-W-C	Mini-Horn w/Strobe	20-31 DC	0.025	20-31 DC	0.164
U-MHT-S100 U-MHT-S100-W U-MHT-S100-C U-MHT-S100-W-C	Mini-Horn-S/T w/Strobe	20-31 DC	0.025	20-31 DC	0.249
U-MHT-S17S U-MHT-S17S-W U-MHT-S17S-C U-MHT-S17S-W-C	Mini-Horn-S/T w/Sync Strobe	20-31 DC	0.025	20-31 DC	0.059
U-MHT-S30S U-MHT-S30S-W U-MHT-S30S-C U-MHT-S30S-W-C	Mini-Horn-S/T w/Sync Strobe	20-31 DC	0.025	20-31 DC	0.088
U-MHT-S60S U-MHT-S60S-W U-MHT-S60S-C U-MHT-S60S-W-C	Mini-Horn-S/T w/Sync Strobe	20-31 DC	0.025	20-31 DC	0.154
U-MHT-S75S U-MHT-S75S-W U-MHT-S75S-C U-MHT-S75S-W-C	Mini-Horn-S/T w/Sync Strobe	20-31 DC	0.025	20-31 DC	0.17
U-MHT-S110S U-MHT-S110S-W U-MHT-S110S-C U-MHT-S110S-W-C	Mini-Horn-S/T w/Sync Strobe	20-31 DC	0.025	20-31 DC	0.249
MHST-1G MHST-1GW	Sync Electronic Horn	20-31 DC	0.030		
MHST-U MHST-UW	Sync Electronic Horn	20-31 DC	0.030		
MMT-1G MMT-1GW	Electronic Signal-8T	20-31 DC	0.024-0.050 (*4)		
MMT-U MMT-UW	Electronic Signal-8T	20-31 DC	0.024-0.050 (*4)		

APPENDIX-C: TROUBLESHOOTING

DEFINITIONS FOR EVENT HISTORY ENTRIES

A. General

ENTRY	INDICATES
ALARM	General alarm
ALRM	Alarm
AVCntr	Alarm Verify counter
Blank	Plain alarm
CrossZone	cross zone point
CZ1A	Cross zone
CZ1B	Cross zone
CZ2A	Cross zone
CZ2B	Cross zone
DETECTOR	General alarm
HEAT	Thermal detector
ION	Ion detector
LCDxx	LCD Annunciator xx
MAIN	Main panel
MANL PULL	Manual pull station
Mntc	Detector maintenance alert
PAS	Positive alarm sequence
PAS INHBT	PAS inhibit switch
PHOTO	PE detector
PRE SIGNL	pre-signal
PreA	Pre-alarm
SUPERVSRY	Supervisory
SUPR	Supervisory
TRBL	Trouble
TROUBLE	Trouble
USERx	User-defined input x
WATERFLOW	Waterflow

B. System Troubles

ENTRY	INDICATES
AC Trouble	AC input low or off
AddrLp 1 DBLSHT	Double short trouble on addressable loop 1
AddrLp 1 OPEN	Open circuit trouble on addressable loop 1
AddrLp 1 SHORT	Short circuit trouble on addressable loop 1
BATT Trouble	Battery input low or off
CITY Trouble	Local Energy circuit open
DACT Acct Trb	DACT account reporting trouble
DACT Com Trouble	DACT communication trouble with main processor
DACT PL x Trouble	Open or short on DACT phone line x
FLASH FATAL Trb	Configuration Flash memory trouble
GRND FAULT Trbl	Ground Fault trouble
LCDxx NoRespons	LCD Annunciator xx programmed but is not responding
LCDxx Not Pgmd	LCD Annunciator xx is not programmed but is responding
LCDxx Trouble	LCD Annunciator xx reports trouble
MNLP Bad Msg	Main processor to loop processor communication trouble
MNLP Fifo Xmit	Main processor to loop processor communication trouble
MNLP NoRespons	Main processor to loop processor communication trouble
NACxx Trouble	NAC xx wiring is open or shorted
PC Pgmr Trb	Control panel is not receiving communication from PC
QuickTest Abort	Quick Test Timer expired causing abnormal exit of Quick Test
Trb Reminder	Trouble Reminder timer expired

C. System Events

ENTRY	INDICATES/NOTES
Alarm Silenced	MAIN, LCDxx shown on bottom line
All AV Ctrs Clr	All AV counters cleared
AutoProgram Run	Auto programming function run
Backup Cnfg Check	Backup configuration validated, result on bottom line
Backup Cnfg Edit	Backup configuration edited
CMIaa ActvnCnfd	Non-relay CM activation confirmed by trouble input on
ConfigsCompared	Backup and primary configurations compared, result on bottom line
ConfigsSwapped	Backup and Primary configurations swapped
EventHist Clear	Event History cleared
Mnt Levl Enter	Entered Maintenance level
Mnt Levl Exit	Exited Maintenance level
Mnt Levl PW Changed	Changed Maintenance level password
NACxx Active Confirm	NAC activation confirmed
Panel Reset	MAIN, LCDxx shown on bottom line
Power Up	
PriConfigCopied	Primary configuration copied to backup
QuickTest Exit	Exited Quick Test, MAIN or LCDxx shown on bottom line
QuickTest Start	Started Quick Test, MAIN or LCDxx shown on bottom line
System Date Changed	Changed system date, old and new dates shown on lines 3 and 4
System Time Changed	Changed system time, old and new times shown on lines 3 and 4
Tech Levl Enter	Entered Tech level
Tech Levl Exit	Exited Tech level
Tech Levl PW Changed	Changed Tech level password
User Levl Enter	Entered User level
User Levl Exit	Exited User level

APPENDIX-D: MODULE INSTALLATION INSTRUCTIONS LIST

This Appendix provides a list of installation instructions for the following optional modules and accessories:

• CAB-BATT	Battery Box	315-033917
• FS-MT	Municipal Tie Board	315-699462
• FS-DACT	Serial Digital Communicator	315-699464
•		
• FS-NPE	Optional Transformer Assembly	315-049120
• FS-RD2	Remote LCD Annunciator	315-049103
• FS-RU2	Serial Relay Unit	315-049308
FS-RE8	Serial Relay Extender	
• FS-SAU2	Serial Annunciator Unit	315-049307
FS-SAE16	Serial Annunciator Extender	
• FS-CT2	Laptop Configuration Tool	315-049380
• PAD-3	Distributed Power Module NAC Expander	315-099082

APPENDIX-E: GLOSSARY

Alarm Signal. A signal indicating an emergency requiring immediate action, such as an alarm for fire from a manual station, a waterflow alarm, or an automatic smoke detector.

Alarm Silence Inhibit. An option that prevents a human operator from silencing the notification appliances for a preset period of time.

Alarm System. A combination of compatible initiating devices, control panels, and notification appliances designed and installed to produce an alarm signal in the event of a fire.

Alarm Verification. A preset option that causes the control panel to verify alarms originated by smoke detectors before indicating an alarm.

Annunciator. A remotely located, electrically powered display, separate from the control panel, containing LEDs or lamps to indicate the states of the fire alarm system.

Audible Signal. An audible signal is a sound made by one or more audible notification appliances, such as bells or horns, in response to the operation of an initiating device.

Authority Having Jurisdiction (AHJ). The organization, office, or individual responsible for approving equipment, installation or procedure.

Auto-Silence. The capability of a control to automatically silence the notification appliances after a preset period of time.

Auxiliary Relays. Control relays that energize only during alarm conditions that are used to either apply power to or remove power from other equipment during an alarm condition.

Class A Circuit. An initiating device or notification appliance circuit within which all components remain fully functional, even though a single open or ground exists in the circuit.

Class B Circuit. An initiating device or notification appliance circuit within which some or all components may be disabled with a single open or ground exists in the circuit.

Detector - Smoke, Ionization Type. A detector employing the principle of smoke's effect on an electrical current flowing in an ionized air chamber.

Detector - Smoke, Photoelectric Type. A detector employing the photoelectric principle of reflection or obstruction of light by smoke.

End Of Line (EOL). A device used to terminate a supervised circuit.

General Alarm. A term usually applied to the simultaneous operation of all the notification appliances on a system.

Ground Fault. A trouble condition in which a low resistance has been detected between the system wiring and conduit ground.

Initiating Device. A manually or automatically operated device such as a manual pull station, smoke detector, heat detector, waterflow switch or tamper switch.

Initiating Device Circuit (IDC). A circuit to which initiating devices are connected.

Labeled. Equipment or materials to which have been attached a label, symbol, or other identifying mark of an organization acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of the production of such labeled equipment or materials. And by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

Listed. Equipment or materials included in a list published by an organization acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of listed equipment or materials. And whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

NEC. National Electrical Code also published as NFPA standard 70.

Notification Appliance. An electrically operated appliance used to indicate the system status such as a bell, horn, strobe light or speaker.

Notification Appliance Circuit (NAC). A circuit to which notification appliances are connected.

Power Supply. That portion of the fire alarm control panel, which provides the power needed to operate all control panel modules, as well as that, needed to operate all electrically powered initiating devices and all notification appliances.

Quick Test. A term pertaining to the test mode of the system, that automatically resets after a service technician tests initiating devices.

Supervisory Alarm. A signal indicating the operation of a supervisory device.

Supervisory Device. A device that monitors the condition of a sprinkler system such as a gate-valve switch, water-level switch, low pressure switch, low temperature switch or fire pump monitor.

Trouble Signal. An audible signal indicating trouble of any nature, such as a circuit break or ground, occurring in the device or wiring associated with a fire alarm signal.

Waterflow Switch. An assembly approved for service and so constructed and installed that any flow of water from a sprinkler system equal to or greater than that from a single automatic sprinkler head will result in activation of this switch and subsequent indication of an alarm condition.

Zone. A designated area of a building. Commonly, zone, is interchanged with initiating device circuit.

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